

# **Bulb Eater®**

## **Model 55 VRS(U) Premium**

### **Owner's Manual**



VRS-U PREMIUM

VRS PREMIUM

## **AIR CYCLE CORPORATION**

2000 S. 25<sup>th</sup> Avenue, Suite C

Broadview, IL 60155

[www.AirCycle.com](http://www.AirCycle.com)

800-909-9709

# Model 55 VRS(U) Premium Bulb Eater®

## Assembly Instructions

When you receive your unit, you need to do the following:

1. Mount the Bulb Eater® onto the drum, tightening the bolt ring with a 15/16 wrench or socket.
2. Screw the entry tube into the lid. This tube can be removed and replaced with T8, T12, or T17 entry tubes. The machine comes with a standard T12 (1.5" diameter) entry tube. If you use the newer T8 (1" diameter) lamps, please purchase a T8 entry tube. Proper entry tube use minimizes the likelihood of fluorescent lamp breakage outside the entry tube.
3. Slowly pour the activated carbon granules into the beige carbon canister avoiding breathing carbon dusts that may be generated, dispose of the bag, and tightly screw down the lid with the five screws provided. Now hang the canister on the drum edge on the small standoffs provided, and plug-in the HEPA filter exhaust air hose from the blue filter casing into the black hole.

** CAUTION**



**wear eye protection**

**AIR CYCLE CORPORATION — (800) 909-9709**

(Note: Training video available at [www.aircycle.com/video](http://www.aircycle.com/video))

# Notes & Special Information

1. You are the proud owner of our latest product, the Bulb Eater® Model 55 VRS(U) Premium. Please call Customer Service to inform us of any problems you may experience.
2. What is in a lamp? – About poisonous materials – Neither the glass nor white powder (“phosphors”) in fluorescent lamps are, in themselves, poisonous. The powder is not phosphorus as some think, but rather a mixture of minerals (that glow in the presence of ultraviolet light) that are a lot like clay. The powder does, however, get contaminated by the mercury in a lamp and should be avoided.
3. Mercury – There is, however, a tiny ball of liquid mercury in each lamp that is very poisonous. The lamp interior is a vacuum, which holds or forms some mercury vapor, just as water evaporates forming water vapor. The amount of mercury is small and getting smaller every year. The mercury concentration is about 40 milligrams a lamp in older lamps, and has been steadily reduced over the last 5 year to about 10-20 milligrams per typical four-foot lamp today (3-5 mg per foot based on lamp length). This is about the size of one half of a pinhead. About 1% of this mercury evaporates into the vacuum, forming a mercury vapor, which carries the electricity down the length of the lamp. Your new Bulb Eater® will remove virtually all airborne powder and mercury vapor (well over 99%). This will allow for lamp destruction in closed quarters, but it is strongly recommended that crushing is done in well ventilated areas to minimize exposure.
4. The HEPA– HEPA stands for High Efficiency Particulate Arrestor (HEPA filters capture at least 99.97% of powder with particle sizes of 0.3 micron, or greater. A micron is 1/1000 of a millimeter, the small marks on a metric scale). Your new Bulb Eater® system contains a dust removal system that exceeds this standard by removing 99.99% of these particles. In your blue case, there are two filters. The first stage is a bag filter that removes 99% of the dust and larger particles, is inexpensive, and must be replaced twice with every full drum of crushed lamps. (Change when the drum is half full and again when it is entirely full, make sure to place all filters on top of the crushed lamps so they can be easily removed prior to processing.) Twenty extra 1<sup>st</sup> Stage filters are included with your Bulb Eater® system. There is a second filter (the HEPA filter), which filters out the final particles. This filter is a molded assembly located behind the 1<sup>st</sup> Stage filter, and is screwed in by hand – requiring a quarter turn. This filter will require replacement after every 10 full drums or as needed.
5. Vapor Removal – The airstreams exiting the blue filter case flow through a black hose to the beige canister containing 22 pounds (lbs.) of activated carbon specially formulated with sulfur. This activated carbon filter can capture, absorb and hold high concentrations of mercury vapor because the sulfur treated carbon converts the vapor into a mineral, allowing the vapor to be bound into the carbon bed. The carbon filter can hold as much as 25% of its own weight in mercury. Since the mercury filter holds 22lbs. of carbon, 5.5lbs of mercury can be collected before saturation, this multiplies out to a calculated capacity of millions of 4’ lamps!
6. Disposal Issues – A user may have to deal with the fluorescent lamp fragments as hazardous waste, following all federal, state, and local environmental regulations. As of January 6<sup>th</sup>,

2000, lamps were included in a subsection of Hazardous Waste regulations called the **Universal Waste Rule**. While crushed lamps do not fall under Federal Universal Waste regulations, many states do recognize crushed lamps as a Universal Waste. We encourage users to contact Air Cycle Corporation or your state EPA office for more details regarding lamp disposal requirements in your locale. (NOTE: Air Cycle Corporation offers a **nationwide recycling program** for facilities to recycle their lighting wastes. Please contact our Sales Department for a detailed lamp-recycling proposal. If you will be crushing in one of these states: CA, CT, MA, ME, MN, MO, RI, a permit is required to operate the machine. Please note that CESQG generators in MA do not need to obtain a permit. Only SQG and CQG need permits. Call for more information.)

7. Safety Precautions – Suitable eye protection (e.g. safety glasses or protective goggles), protective gloves must be worn at all times while the machine is in operation! Steel-toed safety shoes and disposal overalls is recommended to be worn during waste drum change-out or system removal for storage. (NOTE: a full drum can weigh over 500 pounds and care must be taken when lifting and moving full waste drums.) After crushing lamps, insert the rubber plug into the opening of entry tube to seal the drum. When separating the machine from the drum (i.e. when changing from a full drum to an empty drum) let the machine sit “off” for at least 15 minutes before opening the lid. This will allow for most of the residual dust in the headspace of the drum to settle. **It is strongly recommended that the drum be sealed within 2 minutes to minimize potential release of remaining mercury vapors present in the waste drum. Therefore, Air Cycle operation recommends the lid removal-drum change-out or system storage operation be practiced to ensure the operation is performed efficiently and as quickly as possible.** (Call ACC for further directions, if needed.)
8. Changing the Spinner- The “spinner”, or breaking chain, needs to be changed every 10 full drums of lamps or as needed. The chain gradually wears down with use and will eventually lose links as they wear off. To replace a spinner (after changing drums to a clean, empty drum), carefully stand the Bulb Eater® on edge. With an allen wrench loosen the set screw holding the “spinner” on the motor shaft. Slide off the old “spinner” and replace with new “spinner” in the same position. Tighten set screw to secure “spinner” to motor shaft.
9. Once you have adequately reviewed all operating instructions and are aware of all safety precautions, have practiced the drum change-out procedure, donned protective equipment and clothing, connected the proper lamp entry tube and assembled the machine, you are ready to begin crushing your lamps. - To crush your lamps simply turn the machine “on.” Check for suction (i.e. negative pressure) using a gloved hand placed over the end of the entry tube. Carefully line each straight fluorescent lamp over the entry tube, allowing roughly 3 inches of the lamp to enter the entry tube, and then release the lamp. **DO NOT** force the lamp down the shaft! If the machine is running properly, you should feel the suction or negative pressure pulling the lamp into the machine. The operator of the machine should crush no more than one full drum of lamps per 8-hour work shift. This helps ensure OSHA and EPA regulatory compliance! **Please read and review the Operating Instructions (found in this book) before attempting to operate this equipment.**

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(Note: Training video available at [www.aircycle.com/video](http://www.aircycle.com/video))

# Bulb Eater® Operating Procedures

## (Model 55 VRS(U) Premium)

To properly use your Bulb Eater® lamp crushing system, you must...

1. Make every effort to crush lamps in a well ventilated area.
2. Wear safety glasses and protective gloves at all times while machine is in operation.
3. Screw in appropriate entry tube (T12 entry tubes are standard – T8 and T17 entry tubes are available through Air Cycle Corporation.) It is important that a T17 entry tube is used while crushing T17 lamps, T12 entry tubes for T12 lamps, and T8 entry tubes for T8 lamps. (A T8 fluorescent lamp is 1 inch in diameter, a T12 lamp is 1.5 inches in diameter, and a T17 lamp is 2 inches in diameter.) For processing U-shape fluorescent lamps, remove the chute safety cover from the lid and insert the stainless steel chute. For better filtration, plug the entry tube with the rubber plug. If you are not crushing u-shape lamps then make sure that the chute safety cover is in place and the chute is removed. This will greatly minimize outside lamp breakage that may result in potential mercury exposure conditions.
4. Once the appropriate entry tube is screwed into the drum lid, remove the rubber plug from the top of the entry tube and turn on the machine. The master switch is located on the machine control (see next page for picture).
5. Once the system is running, place gloved hand over the lamp entry tube to check for suction (i.e. negative pressure). If the chute for U-shape lamps is in place, push down the trap door and feel for suction. (If you do not feel suction on your gloved hand, turn off your machine and call the customer service department at Air Cycle Corporation for further assistance.)
6. Low suction pressure normally indicates that a filter, located in the blue case, is full and needs to be changed. The 1<sup>st</sup> Stage filter bag should be changed every half drum of crushed lamps, or as needed. The 2<sup>nd</sup> Stage filter cartridge should be changed at least every 10 full drums of crushed lamps, or as needed. **DO NOT throw filters in the trash! Place used filters on top of crushed lamps inside the drum.** (See Bulb Eater® Change Procedure sheet for more information on how to properly change the system's filters.)
7. Once you have determined that the drum is under negative pressure (i.e. suction at entry tube), you can now safely crush dry fluorescent lamps. **DO NOT crush wet lamps.**
8. Line the fluorescent lamp over the lamp entry tube and allow for roughly 3 inches of the lamp to enter the tube. Let the vacuum pull the lamp into the drum. **DO NOT force the lamp down the entry tube!** Should a lamp become wedged while entering the drum through the entry tube, simply grab the lamp tube and pull the tube up an inch or two and then release the tube. This will dislodge the jam and the tube should fall the rest of the way into the drum. (Occasionally a wood rod may be needed to clear a jam.)
9. For U-shape fluorescent lamps (VRS-U only), pull the safety cover up from the lid and insert the stainless steel chute. Pull off the bar between the two ends of the lamp and then push the lamp through the trap door of the chute and let go. **DO NOT crush any u-tube lamps if the bar cannot be removed. Drums containing u-tube bars will incur significantly higher recycling charges.** Box those lamps instead.
10. **DO NOT** crush more than one full drum of lamps per 8-hour period per employee. This will help ensure that Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) standards are met.
11. After crushing, let the machine sit “off” for at least 15 minutes after the purge cycle is complete before opening the lid, (if you plan on removing the crushing apparatus from the drum for any reason) or simply seal the top of the entry tube with the rubber plug once the purge cycle is complete. When the machine is not in use, make sure that all openings are sealed.

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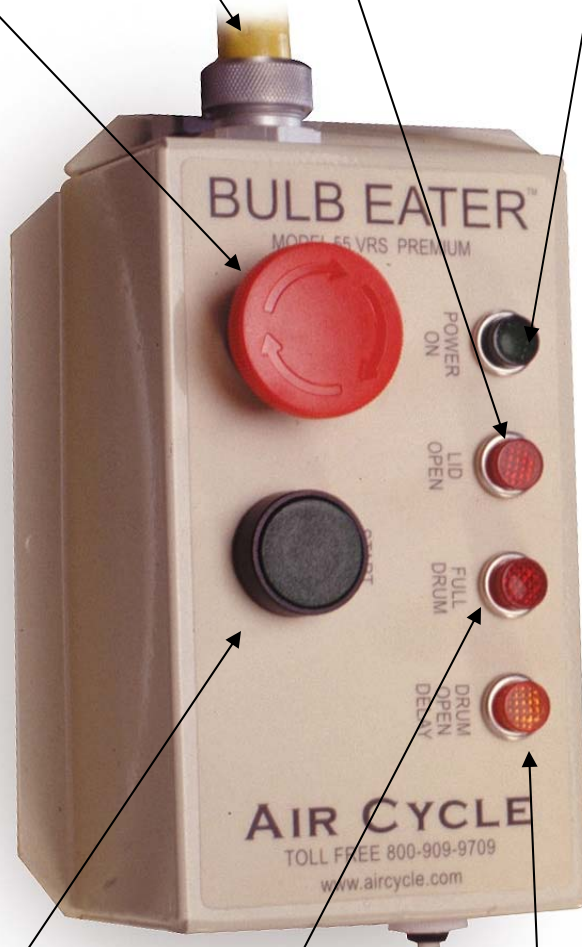
(Note: Training video available at [www.aircycle.com/video](http://www.aircycle.com/video))

**Stop Switch**  
Push to stop.  
Twist to release.

**Power Outlets**  
Vacuum & Motor

**Lid Open**  
Stops system when the lid  
is lifted off the drum.

**Power On**  
Shows power is present.



**Start Switch**  
Only operates if the stop  
switch is released.

**Full Drum**  
Stops system when the fragments  
reach the sensor.

**Drum Open Delay**  
The crusher motor stops with the stop  
button, but the vacuum will continue  
to purge the vapors with fresh air.

# Premium Bulb Eater® Filter Change Procedure

<p>1<sup>st</sup> Stage Filter changed <b>twice every full drum</b> of crushed lamps 2<sup>nd</sup> Stage HEPA Filter changed at least <b>once every 10 drums</b> of crushed lamps</p>
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1. Confirm that the Bulb Eater® is clearly “off” and not operating.
2. The operator must wear the following personal protective equipment when changing *any* of the two Bulb Eater® filters:
  - Safety glasses or protective goggles
  - Gloves

**\*\* Note that spent filters must NEVER be unattended. Spent filters must either remain in the blue filter case attached to the unit, be sealed in the drum of crushed lamps, or bagged (i.e. ziplock) to avoid mercury release. DO NOT DISPOSE OF FILTERS IN THE TRASH\*\***

## **Replacing the 1<sup>st</sup> Stage filter:**

3. Locate the right-hand door on the blue filter case of the Bulb Eater®.
4. Remove black nozzle from blue door and immediately cap the end of the black nozzle to prevent dust from falling to the floor.
5. Press the yellow label marked **PUSH** on the far most right edge of the curved blue filter case to open the filter case door.
6. Carefully remove the door from the blue filter case.
7. Immediately place a circular white label from your Bulb Eater® filter kit over the center hole on the front of the 1<sup>st</sup> Stage filter. This prevents mercury-laden dust from escaping during the change-out process.
8. Once the entry hole to the 1<sup>st</sup> Stage filter is safely covered with the white label, grab each side of the brown cardboard front of the filter with both hands.
9. Carefully pull the 1<sup>st</sup> Stage filter slowly out of the blue filter case and place it on top of the crushed glass within the drum for disposal. *Avoid compression of the filter to minimize the release of mercury-laden dust.*
10. Insert a new filter into the filter case, making sure the cardboard “front” is securely in place and the bag portion of the filter is unfolded and beside the cartridge, not rolled up in front of the cartridge.
11. Replace the blue door and verify that it is latched.

## **Replacing the 2<sup>nd</sup> Stage HEPA filter:**

12. Follow steps 1 through 7 above
13. Locate the 2<sup>nd</sup> Stage filter in the middle of the blue case.
14. Rotate the filter a quarter turn to the left (counter-clockwise).
15. Once the HEPA cartridge is free, carefully remove it from the blue filter case and place it in the full drum along with the crushed lamps and 1<sup>st</sup> Stage filters for disposal.
16. Replace both filters and replace the blue door, verifying that the door is secure.

**WARNING! Only lamps and filters (placed on top of the crushed glass) can be inside the drum! No extraneous materials or liquids! Do NOT place filters anywhere inside the drum other than on top of crushed lamps.**

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(Note: Training video available at [www.aircycle.com/video](http://www.aircycle.com/video))

# Bulb Eater® Do's & Don'ts

## Don'ts

- Forget to check for suction (i.e. negative air flow) at the top of the entry tube and also for air blowing out the bottom of the beige carbon canister.
- Turn “on” machine without removing safety plug. Failure to remove plug will ultimately damage vacuum.
- Use the wrong entry tube. If you intend to crush T8 lamps (1” diameter), then you must use a T8 entry tube.
- Crush any lamps without confirming that both 1<sup>st</sup> and 2<sup>nd</sup> stage filters are in place.
- Crush wet lamps. Wet powder will cause system errors.
- Force the lamp down the entry tube.
- Crush more than one full drum of lamps per 8 hour period without confirming with Air Cycle that the quantity is ok.
- Remove the crushing lid directly after crushing the lamps. Let the machine sit for at least 15 minutes before opening lid.
- Leave a drum of crushed lamps open without a lid in place for longer than 2 minutes.

## Do's

- Read the manual from cover to cover.
- Have all employees using the Bulb Eater® read the manual.
- Test all employees who use the machine on how to properly use the system.
- Call Air Cycle Corporation should any problems arise.
- Take advantage of Air Cycle Corporation's recycling services throughout North America for intact/crushed lamps, ballasts, batteries, and e-waste.
- Call Air Cycle Corporation with any suggestions. All of our best improvements have come as a result of customer feedback. Help us improve our program for you and for others to come.
- Let us know if there is anything else we can do to help you.

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# Mercury Hazards

## ***Mercury Emissions***

The disposal of mercury-containing fluorescent lamps and the potential for emissions is of concern because mercury is a highly toxic metal that bioaccumulates through the food chain. Mercury also has a vapor pressure of  $2 \times 10^{-3}$  mm (at 25°C) and is volatile (i.e., readily forms mercury vapor) at room temperature. Therefore, emissions of mercury in liquid or vapor form require health and environmental consideration. The volatilization is especially significant with respect to human health, as it results in ambient mercury vapor that can be absorbed into the human body through various pathways. These include direct inhalation, ingestion through surface contamination and percutaneous absorption of elemental mercury. Generally, excessive exposure to various forms of mercury has been shown to adversely affect the human central nervous system, lungs, kidneys, skin, and reproductive system.

## ***Local Effects***

Mercury is a primary irritant of the skin and mucous membranes. It may occasionally be a skin sensitizer in some individuals.

## ***Systemic Effects***

Acute (short-term) poisoning due to mercury vapors adversely affects the lungs primarily, in the form of acute interstitial pneumonitis, bronchitis, and bronchiolitis.

Chronic (long-term) exposure to lower mercury levels over prolonged periods of time produces symptoms that can vary widely from individual to individual. These may include weakness, fatigability, loss of appetite, loss of weight, insomnia, indigestion, diarrhea, metallic taste in the mouth, increased salivation, soreness of mouth or throat, inflammation of gums, black line at the gums, loosening of teeth, irritability, loss of memory, and tremors of fingers, eyelids, lips, or tongue. In general, chronic mercury exposure produces four classical signs: gingivitis, excessive salivation, increased irritability, and muscular tremors. Rarely are all four seen together in an individual case. More extensive exposures to excessive mercury levels, either by daily exposures or one-time, can produce extreme irritability, excitability, anxiety, delirium with hallucinations, melancholia, manic-depressive psychosis, and adverse effects on the reproductive organs. Either acute or chronic exposure may produce permanent changes to affected organs and organ systems. Excessive exposure to various forms of mercury has been shown to adversely affect the human central nervous system, kidneys, and reproductive system.

Table 1 provides a summary of the clinical importance of various forms of mercury.

## ***Abrasion and Cut Hazards***

The primary hazard resulting from handling broken lamps or crushing lamps is the potential release of airborne glass particulates resulting in skin, eye, and respiratory tract irritation with the possibility for cuts and lacerations to the eye, skin, and respiratory tract tissue upon contact. The eyes and skin can also be cut or lacerated by sharp glass edges or metal components contained in the crushed lamp waste.

## ***Crushing Hazards***

Perhaps the greatest potential for physical injury during the Bulb Eater® use other than laceration from broken glass or metal components is physical injury from movement or mishandling of the 55-gallon drums. Thus, forklifts or other suitable lifting devices equipped with drum grabbers and drum cradles must be used for transporting, moving, and positioning the lamp waste collection drums when filled with crushed fluorescent lamps. It is also extremely important that the manual be followed closely. Failure to operate the machine properly could lead to dangerous mercury vapor exposure. While boxing lamps intact, be careful to avoid breaking the lamps. When intact lamps break, unfiltered vapors are released.

## Other

A review of manufacturers' fluorescent lamp Product Safety Data Sheets (PSDS) reveal there are no known health hazards from exposure to lamps that are intact. The PSDSs further disclose that no adverse effects are expected from occasional exposure to broken lamps but stated, "Avoid prolonged or frequent exposure to broken lamps unless there is adequate ventilation." The PSDSs indicate that the major hazard from an occasional broken lamp is the possibility of sustaining glass cuts.

Table 1. Clinical Importance of Elemental and Inorganic Forms of Mercury					
Form	Element State	Source	Absorption*	Primary Effects	Secondary Effects
Liquid Mercury	Hg <sup>0</sup>	Thermometers; barometers; manometers; fluorescent lamps; switches; rectifiers; batteries (1)	Dermal contact – minimal absorption Ingestion – poor absorption	Poorly absorbed through GI tract (0.01%) or dermally; Systemic toxicity is rare	None
Mercury Vapor	Hg <sup>0</sup>	Industrial	Inhalation – 80% absorbed Percutaneous – minimal absorption	Lungs, skin, eyes, gingiva (gums)	CNS**, kidneys (2)
Mercury Salts and Compounds	Hg <sup>+1</sup> Hg <sup>+2</sup>	Medicines; antiseptics; disinfectants; electric batteries; industrial compounds	Ingestion – 10% absorbed Dermal Contact – lethal doses can be absorbed by animals	Kidneys GI Tract	CNS

### Table Abbreviations and Notes

- CNS Central Nervous System
- GI Gastrointestinal
- Hg Atomic symbol for elemental mercury
- \* In humans, the biologic half-life of all forms of mercury is 40-70 days
- \*\* Crosses the blood-brain barrier
- (1) Breakage of any of these devices can result in the release and volatilization of liquid mercury in air as mercury vapor
- (2) Mercury accumulates in many tissues, but most importantly the brain and kidneys

## Environmental Effects

Additionally, mercury is harmful to the environment. Mercury bioaccumulates in the food chain and as such poses many of the adverse effects described on the human body during the consumption of mercury-contaminated food (e.g., predator fish – swordfish, tuna, etc.) Mercury in the environment is deposited and revolatilized many times, with a residence time in the atmosphere of a few days.

Most mercury-containing fluorescent lamps must be recycled or disposed as a toxic characteristic hazardous waste as defined in the Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA). This is due to the concentration of the mercury and/or other toxic metal content in the waste typically exceeding EPA's Toxicity Characteristic Leaching Procedure (TCLP) limits quantified by TCLP analytical tests.

The most environmentally sound and preferred disposal method for spent fluorescent lamps is recycling. Fluorescent lamp recycling allows the mercury to be separated from the other fluorescent lamp components (e.g. glass, metal, etc.) and collected for reutilization.

# Mercury Standards

## Occupational Safety and Health Standards

The Occupational Safety and Health Administration (OSHA) regulation Title 29 of the Code of Federal Regulations (CFR) 1910.1000, Air Contaminants, Table Z-2, and an OSHA Compliance Directive Interpretation of 9 September 1996 regarding mercury exposure limits has set the Permissible Exposure (PEL) for all forms of mercury at 0.10 milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ) of air (equivalent to 6.1 parts per billion, ppb). The Permissible Exposure Limit (PEL) is an eight-hour Time Weighted Average (TWA) concentration limit in air that nearly all workers can be exposed to without adverse health effects. The American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values for Chemical Substances and Physical Agents for 2001 has set recommended air standards for the elemental and inorganic forms of mercury (including inorganic mercury vapor) at 0.025 milligrams per cubic meter ( $\text{mg}/\text{m}^3$ ) as an eight-hour Threshold Limit Value (TLV) Time Weighted Average (TWA) concentration in air. A "Skin" notation is also designated with the standard indicating skin, eye and mucous membrane contact as a significant pathway of absorption.

Table 2 provides a summary of mercury vapor exposure limits by various organizations including OSHA, ACGIH, the National Institute of Occupational Safety and Health (NIOSH) and the National Academy of Sciences (NAS).

Table 2. Mercury Vapor Exposure Limits Summary							
OSHA PEL 8-Hour TWA ( $\text{mg}/\text{m}^3$ )	ACGIH TLV 8-Hour TWA ( $\text{mg}/\text{m}^3$ )	ACGIH 30- minute Excursion Limit ( $\text{mg}/\text{m}^3$ )	ACGIH Instantaneous Excursion Limit ( $\text{mg}/\text{m}^3$ )	NIOSH REEL- TWA ( $\text{mg}/\text{m}^3$ )	NIOSH IDLH ( $\text{mg}/\text{m}^3$ )	NAS SMAC 1-Hour TWA ( $\text{mg}/\text{m}^3$ )	NAS SMAC 24-Hour TWA ( $\text{mg}/\text{m}^3$ )
0.1 (Skin) [12.2 ppb]	0.025 (Skin) [3.0 ppb]	0.075 (Skin) [9.1 ppb]	0.125 (Skin) [15.2 ppb]	0.05 (Skin) [6.1 ppb]	10.0 [1,219 ppb]	0.08 [9.8 ppb]	0.02 [2.4 ppb]

### Table Abbreviations and Notes

ACGIH	American Conference of Governmental Industrial Hygienists - 2002 Threshold Limit Values
IDLH	Immediately Dangerous To Life And Health
$\text{mg}/\text{m}^3$	Milligrams Per Cubic Meter (air)
NAS	National Academy of Sciences
NIOSH	National Institute of Occupational Safety and Health
PEL	Permissible Exposure Limit
ppb	Parts per billion (in air)
OSHA	Occupational Safety and Health Administration
REEL	Recommended Environmental Exposure Limit
Skin	Percutaneous (dermal) exposure (as route of exposure)
SMAC	Spacecraft Maximum Allowable Concentrations for Selected Airborne Contaminants (1996)
TLV	Threshold Limit Value
TWA	Time Weighted Average

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# Recycling Instructions

By purchasing this machine, you are now part of our nationwide Recycling Program. Listed below are products you can recycle, and some guidelines to follow to properly package the items for pick-up. When you are ready for a pick-up, please fill out your Pick-Up Request Form and fax to (708) 344-7875.

## Recyclable Items

- Fluorescent lamps
- HID lamps
- Computers, Monitors, Keyboards, Laptops, Modems, Copiers, Fax Machines, Hard Drives
- Batteries
- Ballasts

## How to Pack and Ship Recyclables

### Drums for Crushed Lamps:

Steel drums for crushed lamps are available through Air Cycle Corporation. Crushed lamps must be properly handled to avoid contamination of the air and surfaces in the surrounding area. **Nothing but crushed fluorescent lamps and Bulb Eater® filters can be put in the drum (i.e. tape, hardware, cardboard, or any other non-lamp foreign material) or additional charges will be levied. Filters should be placed on top of the crushed lamps.** Foreign materials often shut down processing/recycling machines, requiring a clean-out. When the drum is filled, the crushing apparatus should be moved to an empty drum and clamped down. The full drum must be covered, clamped down and properly labeled to indicate hazardous or universal waste.

### Intact Lamps

To save cost and the environment, whenever possible, use the same carton that your new bulbs came in. These cartons are well suited for reuse and will help prevent breakage. The dividers should be taken out and spent lamps carefully placed in the carton until full (approximately 30% more lamps than the original count of new lamps will fit in the carton). When full, close the end flaps and tape securely. Place a tag on the carton to properly mark it for recycling.

There are 4' and 8' boxes also available through Air Cycle Corporation. (The boxes will only be available through Air Cycle Corporation, so please call if you need them.)

### U-shaped and circular lamps

Whenever possible, reuse the packaging materials from your original lamps for your new lamps. If this is not possible select the box that will limit the movement of the lamps within the carton. **DO NOT TAPE LAMPS TOGETHER.**

### Ballasts

Make sure that PCB-contained ballasts are separated from the non-PCB containing ballasts. They must be placed in an U.N. approved, non-leaking container such as an Air Cycle drum or ballast bucket. If there are leaking ballasts, they must be put into a plastic bag, separated from the above mentioned.

### Batteries & Computer Hardware

All batteries and computer hardware equipment can be recycled as long as they are segregated from all other recyclables. (The batteries must be separated from the computer hardware as well).

### Shipping:

Whenever possible, palletizing and securing lamps with shrink-wrapping will protect and speed up handling. Cartons should be stacked in an interleaved fashion to support each other. The cartons should not be stacked more than 5' high on the pallet.

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Pick-Up Request Form

**AIR CYCLE CORPORATION**

2000 S. 25<sup>th</sup> Avenue, Suite C • Broadview, IL 60155  
Tel (800) 909-9709 • Fax (866) 909-6725 • [www.AirCycle.com](http://www.AirCycle.com)



Date: \_\_\_\_\_

**Generator Pick-Up Location**

Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City/State/Zip: \_\_\_\_\_  
 Contact: \_\_\_\_\_  
 Contact E-mail: \_\_\_\_\_  
 Contact Phone: \_\_\_\_\_  
 Contact Fax: \_\_\_\_\_  
 EPA ID#: \_\_\_\_\_

**Generator Billing Information**

Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City/State/Zip: \_\_\_\_\_  
 Accounts Payable Contact: \_\_\_\_\_  
 Accounts Payable Phone: \_\_\_\_\_  
 Accounts Payable Fax: \_\_\_\_\_  
 PO#: \_\_\_\_\_

**Transportation Requirements**

A truck with a lift gate is required to pick up the material. Yes \_\_\_ No \_\_\_  
 A forklift available for loading the material onto the truck. Yes \_\_\_ No \_\_\_  
 The material will need to be manually loaded onto the truck. Yes \_\_\_ No \_\_\_  
 Height and length restrictions for the loading dock are: \_\_\_\_\_  
 A full size tractor-trailer can fit into the loading dock. Yes \_\_\_ No \_\_\_  
 The material is stored: \_\_\_\_\_  
 Available Loading Hours: \_\_\_\_\_

**Material To Be Delivered:**

55 Gallon Steel Drums \_\_\_\_\_  
 4' Fiber Drums \_\_\_\_\_  
 8' Fiber Drums \_\_\_\_\_  
 4' Lamp Boxes \_\_\_\_\_  
 8' Lamp Boxes \_\_\_\_\_  
 5 Gallon Poly Pails \_\_\_\_\_

**Material To Be Picked Up:**

<b>Lamps:</b>	Quantity	<b>Batteries:</b>	Weight	<b>The Material Is Packaged In:</b>	Quantity:
55 Gallon <b>Drums of Crushed Lamps</b>	_____	Mixed	_____		
4ft. or Less Fluorescent Lamps	_____	Alkaline	_____	Cardboard Boxes	_____
More than 4ft. Fluorescent Lamps	_____	Lead Acid	_____	4' Fiber Drums (85 count)	_____
HID (Mercury Vapor, Metal Halide, High-pressure Sodium)	_____	NiCad	_____	4' Fiber Drums (185 count)	_____
U-Bend / Circular	_____	NiMH	_____	8' Fiber Drums (85 count)	_____
Compact w/o Ballast	_____	Lithium	_____	Poly Pails (5 Gallon)	_____
Compact w/Ballast	_____	Mercury	_____	Other:	_____
Shattershield / Coated	_____	Zinc Carbon	_____	<b>Total of Pallets:</b>	_____
Incandescent	_____	<b>Ballasts:</b>	Weight		
Halogen	_____	Non-PCB	_____		
UV	_____	PCB	_____		

**Other Waste for Recycling Pick Up:**

Office Machinery (Monitors, Hard Drives, Keyboards, Printers, TVs and etc.) \_\_\_\_\_  
 Mercury Containing Devices (Thermometers, Mercury Switches, and etc.) \_\_\_\_\_

**Special Instructions:**

The marked material is to be properly identified and prepared for transportation and tender in accordance with all applicable statutes, ordinances, permits, rules and regulations of the Federal, State, and Local governments in whose jurisdiction such material originates, passes through, or is tendered for delivery (certify for declare) under penalty of perjury that the foregoing is true and correct.

**Please fill out this form completely and fax it to 866-909-6725 or e-mail to [pickup@aircycle.com](mailto:pickup@aircycle.com)**

# The Bulb Eater® Filter Log

Location \_\_\_\_\_

New Drum Start Date	Date Drum Became Full	BLUE CASE FILTER	
		1st Stage Filter Changed? <i>change twice per drum</i>	2nd Stage HEPA Filter Changed? <i>change every 10 drums</i>
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____
		<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____	<input type="checkbox"/> YES <input type="checkbox"/> NO Date _____

## Reminders:

- \*Place used filters on top of crushed lamps in drum for recycling.
- \*Label each new drum with a Hazardous or Universal Waste Label.  
(Depending on applicable state regulations.)

**\*\*Save this form for your records\*\***

# AIR CYCLE CORPORATION

## VRS / VRSU Bulb Eater® Parts List

Part #

Premium	Standard	Description	U/M
330-005	330-050	BE 55 VRS Bulb Eater®	EA
330-010	330-060	BE 55 VRSU Bulb Eater®	EA
55-132		Spinner Assembly w/ wrench	EA
330-410	55-240	Motor: Main Crusher Ass'y	EA
55-290	55-295	T5 Entry Tube	EA
55-485	55-300	T8 Entry Tube	EA
55-490	55-301	T10 Entry Tube	EA
55-487	55-303	T12 Entry Tube	EA
55-489	55-305	T17 Entry Tube	EA
55-306		U-Tube Removable Chute	EA
55-480	55-308	U-Tube Upgrade Kit (new lid, chute and cover)	EA
330-870		U-Tube Safety Cover	EA
55-310		Filter Bags for VRS (10 disposable 1st stage filters)	PKG
55-325		Filter Cartridge (2nd stage HEPA grade)	EA
55-330		Filter Combo Kit (20 pack bag filters & 1 2nd stage cartridge)	EA
55-313	55-312	Power Filter Unit w/o Mounting Bracket 120v, 50-60hz	EA
55-340		Inlet Filter Hose w/ Fittings	EA
55-345		Outlet Filter Hose w/ Fittings	EA
331-720	N/A	Power Cord	EA
55-410		Carbon Canister, w/o Carbon	EA
55-450		Carbon Canister w/carbon	EA
55-420		Carbon, Activated 22 lbs, Sulfur impregnated	EA
330-280	55-370	Lid for VRS	EA
330-282	55-380	Lid w/ U-Tube Opening	EA
55-400		55 Gallon Drum, Epoxy lined, plain lid & bolt ring clamp	EA
55-425		55 Gallon lid w/ gasket	EA
55-440		55 Gallon locking ring, heavy duty 12 gauge w/ bolt	EA
330-793		Plug, T8 Entry Tube	EA
330-795		Plug, T12 Entry Tube	EA
330-798		Plug, T17 Entry Tube	EA

**2000 S 25th Ave, Suite C, Broadview, IL 60155**

**PH: 800-909-9709 FAX: 708-223-1045**

† Premium Bulb Eaters are equipped with a Control Box

## **\*\*Warranty Information\*\***

The company warrants The Bulb Eater® for one (1) year from the date of original purchase from the distributor or manufacturer against defects in workmanship and/or materials under normal usage. This warranty does not cover damage resulting from shipping, negligent handling, misuse or lack of reasonable care.

Parts that prove to be defective during the one (1) year warranty period will be either repaired or replaced at the option of Air Cycle Corporation. The right is also reserved by Air Cycle Corporation to replace the product in lieu thereof.

The full remedy for breach of this warranty and sole obligation of Air Cycle Corporation is the repair or replacement of the defective Bulb Eater® at Air Cycle Corporation. Air Cycle Corporation shall have no liability whatsoever at any time for any personal injury or property damages or for any special, indirect, or consequential damages of any kind.

This warranty is strictly limited to its terms and is in lieu of any and all other understandings, warranties and conditions, written or oral, whether expressed or implied.

**Please fill out the blanks below and return to Air Cycle Corporation.** Upon receipt, the warranty will become effective until one (1) year from purchase date.

Thank you for your business.

**Company Name** \_\_\_\_\_

**Name of Contact** \_\_\_\_\_

**Address** \_\_\_\_\_

**City/State/Zip** \_\_\_\_\_

**Phone** \_\_\_\_\_

**Fax** \_\_\_\_\_

**Fax or Mail Form to:**  
**AIR CYCLE CORPORATION**  
2000 S. 25<sup>th</sup> Ave. Suite. C  
Broadview, IL 60155  
Fax 708-344-7875

**Shipping date:**

**Serial#:**