

Facts about Mercury Vapor Bulbs - by: Bob MacCargar

I've been meaning to write this for some time. I hope that it will clear up some things for the thinking people. I will also put it in the files section for future reference so new ones can review it. I believe it is important information, so please read it through if you have the time. If nothing else, read the end of this composition.

I have at this time I have tested well over a 130 Reptile Mercury Vapor bulbs for UVB out-put, UVB decay, and failure rates. The Connecticut Iguana Sanctuary (AJ Gutman, editor of the Iguana Magazine and board member of the ISS) has tested the failure rate of over 300 Self Ballasted Mercury Vapor bulbs. This is a combined number of over 400 lamps.

Mercury Vapor Bulb FACTS

1) Self Ballasted Mercury Vapor (SBMV bulbs) bulbs have a filament inside that works as a ballast. This filament is the weak point in the bulb. Just as you will have to replace standard incandescent bulbs in your habitat due to vibration failure, so will the self ballasted needs to be changed*. (Halogen bulbs last longer in habitats because halogen gas is used to capture vaporized tungsten atoms and replace them on the filament thus allowing the filament to run hotter and longer than conventional incandescent tungsten bulbs. Halogen bulbs produce UVA and a little of the UVB spectrum, but only in the upper nanometer range) SBMV bulbs that are mounted in solid fixtures, such as on walls and ceilings in your house will fail less often due to being mounted on a solid foundation rather than inside (or on) a freestanding habitats. The less vibration, the longer lasting the bulb. The obvious advantage to this bulb is that it performs 3 functions, heat, light, and UVB. The disadvantage is that when it fails, all three are gone. MV lamps used for reptile applications have an AVERAGE life of 6 months. Some will last shorter, some longer, but with the combined study of over 400 lamps, 6 months is the average.

*Self ballasted MV lamps used in most commercial applications will last up to 10,000 hours (well over a year) because of the way they are mounted.

** As long as the ambient air temperature is above 65 degrees, spending the day without the lamp won't be any more than a minor discomfort for your animal. Also, if the ambient air allows, run a small HE or CHE in another section of the habitat in case of failure of the SBMV lamp.

2) External ballasted Mercury Vapor lamps will NOT fail due to tungsten filaments. They have proven to be excellent sources of UVB. They will require optional light and heat sources such as halogen lamps. Halogen lamps run "hot" for the wattage so be careful when setting them up.

3) Mercury Vapor bulbs will decay on the AVERAGE of 70%. Some will decay less and some will decay more. Simple terms, a 160wt SBMV FLOOD lamp that starts at 80uW/cm²@12" will decay (on the average) of 64uW/cm² giving you 16uW/cm²@12". Most of the decay happens very quickly in the first few days. It then levels off over the next several months. This happens to all MV bulbs regardless

of the maker. We have recently discovered that some of this decay may be a product of the composition of the glass changing from UVC exposure inside the glass.

4) MV bulbs produce 3 times more UVB in the 290-300 (D-UV) nanometer range than "tube" type UVB bulbs of the total UVB out-put. 10uW/cm²@12' from a MV FLOOD lamp is equivalent to 30uW/cm² from a tube lamp. This fact helps explain why every rehabilitator I have spoken to sees a remarkable difference in the effects of MV lamps over tubes even though they may be using MV FLOOD lamps that are only emitting 10-15uW/cm². (I still recommend using ZooMed 5.0 tubes with MV Flood style lamps).

5) Mercury vapor bulbs do NOT emit any strange or mysterious rays. The entire electro magnetic spectrum can be, and is mapped by spectral radiometers. Regardless of what you may have read on some sites, Mercury Vapor bulbs do not emit any UVC at any distance. I have taken readings from MV lamps producing over 2,000uW/cm²@12" and have never registered even 1uW/cm² of UVC.

6) Both Mercury Vapor lamps and florescent tubes contain mercury and should be handled with care. Mercury Vapor bulbs have an arc tube that contains a minute amount of liquid mercury under pressure that vaporizes with an electrical charge. Strip lights contain low pressure mercury vapor which when iodized (electric current passed through it) emits UV light. This energy (UV light) is then absorbed by a thin coating of white phosphor on the inside of the bulb. The white phosphor uses the energy from the UV light to emit visible light (it fluoresces). Some energy is wasted as heat but most is changed to visible light.

6) In a recent study by Dr. Gehrman and associates, of spiny tailed iguanas, showed that MV SPOT lamps brought the hydroxyl (OH²⁵) levels in the blood equal to those found in the wild. Interestingly the majority of creatures in this controlled study also preferred to bask under the Mercury Vapor SPOT lamps in comparison to the alternative UVB light and heat source.*

*Please see the files section for the complete study, "Dr. Gehrman's comparison study".

7) T-Rex and ZooMed Mercury Vapor self ballasted FLOOD lamps have about the same decay and failure rates RIGHT NOW. They both produce about 12-20uW/cm² on the average after they have decayed. Both have a life span of about 6 months on the AVERAGE. It is futile to raise one over the other at this time. Some will find the T-Rex FLOOD as the better bulb and has more longevity and better UVB and some will find the ZooMed FLOOD has out lasted and has higher UVB. Over 400 bulbs in almost three years, we have found that it's a tie, on the AVERAGE for the SBMV FLOOD lamps.

8) T-Rex Mercury Vapor self ballasted SPOT lamps have the same AVERAGE failure rate as the FLOODS yet they create incredible UVB. I have found NO advantage of the 160wt SPOT over the 100wt SPOT. These lamps both produce 80-150uW/cm²@12" after decay for as long as the burn. For heat, light, and UVB, these lamps can't be touched (as of now). There isn't any difference in OH²⁵ production in

the blood with the sun compared to the SPOT lamp, thereby proving that the entire creature does not need to be bathed in the UVB. SPOT lamps also have the advantage of giving the creature more UVB with less exposure to the care keeper since the UVB is focused on a precise area and little to none in the radiant directions.

9) Westron Lightings external ballasted lamps are the product to watch. These lamps are not compromised by the failure of internal ballast. Westron has only seen 3 bulb failures since its inception and carry a full 6 month non-pro-rated warrantee. Great for smaller reptiles or for larger animals with added light and heat compliments.

10) BigApple Capture the Sun Mercury Vapor lamps. These are advertised as FLOOD lamps yet are a SPOT lamp. They contain an internal ballast that is in a "second" tube. This may be why those that have tried them say that they have less heat than the bulbs from the two other name brand distributors. (We have found the same thing.) The bulbs that we tested had good UVB, 50-70uW/cm². All the bulbs that we tested failed before two months or sooner. The CTIS bought 50 of these bulbs over a year and also had a 1-2 month failure rate. None lasted over three months. BigAppleReptile is an excellent distributor, yet for some reason Steve has refused to change his false advertising since first posted and continues to sell these lamps. We do not recommend these lamps.

In conclusion;

For those that think that Mercury Vapor lamps are to much trouble, I ask "Why do you have an exotic creature in your house?" If easy is what one wants, I would suggest a gerble or cat. Reproducing the requirements for what is considered an exotic reptile is no easy task. The major distributors have good warrantees on a product that goes through major abuse (in most cases). It's up to the individual to be responsible to take advantage of these warrantees.

My friend AJ, mentioned earlier has purchased over 300 lamps and NEVER returned one of them, sighting the hassle involved. I had to ask her "What is the hassle compared to caring for 50 near dead reptiles at one time?" So why does she continue to use them? "Because I see remarkable results with them", says AJ.*

*AJ Gutman is a reptile medical transcriber, from German to English and her husband, the "Doc", is an emergency room doctor. They go to the outer envelope of reptile rehabilitation, even doing surgery on the kitchen table.

On a very good and well known website, I read that T-Rex lists all the zoo's that use the Mercury Vapor bulb and then goes on to state that our living rooms aren't ZOO's. I have to ask "Why then are there WILD creatures in them? Should we care for these creatures in a substandard way? If so, what right do we have to own them?"

Keep in mind that as more people become aware of what the reptile lamps produce (or don't) in the way of true UVB, products will change. This writing is accurate as of 1/2004 and might be out dated in six months.

Bob Mac