

## UVB-100 Frequently Asked Questions

### **How does the UV impact the wiring and polymeric materials in our chamber?**

The UVC energy from the emitter is low power and does not affect typical vacuum materials such as Teflon and Viton.

### **What is the wave-length or the wave spectrum?**

The primary wavelengths are 254nm (70%) and 185nm (30%) for the standard emitter.

### **Will the emitter stay mounted on the chamber after bake-out?**

Yes, the emitter stays in the chamber at all times. Unless you have it mounted on a bellows.

### **What is the maximum temperature that I can bake out my system to?**

The maximum radiant bake out temperature for the standard emitter is 200 degrees Celsius. The limitation is the electrical feed through.

### **Since there is Mercury in the emitter, what happens if I drop a sample mount on the emitter and break it?**

There are a wide range of mercury spill kits available, and also Indium foil acts as a getter for mercury vapor. However, if care is used on the placement of the emitter then the emitter would not be in danger of breaking. It is also possible to place a shield between the emitter and specimen stage to protect the emitter with minimal reduction on performance. We are developing a new type of emitter, the ZCUVE (zero clearance UV emitter) which will not protrude into the chamber.

### **What are the primary differences between using IR or UV to desorb water vapor in a vacuum chamber?**

The primary difference between using UV or IR to desorb water are #1 heat - the UVB-100 does not significantly heat up the chamber or mechanical parts, and #2 IR requires a direct line of site where as UV can reflect off the inner surfaces of the vacuum chamber.

### **How much UVC power do I need for my chamber?**

The typical run of thumb is 0.4mw of UV power (254nm) / cm<sup>2</sup> of surface area, or 2.5mw per square inch.

The chart below gives some helpful values for common sizes in inches

| <i>Cylinder Diameter (Inches)</i> | <i>Area/in. of Length (Sq. inches)</i> | <i>Area of 2 Flat Cylinder Ends (Sq. Inches)</i> |
|-----------------------------------|--|--|
| 1.0                               | 3.14                                   | 1.57   |
| 1.5                               | 4.70                                   | 3.54   |
| 2.0                               | 6.28                                   | 6.28   |
| 2.5                               | 7.85                                   | 9.81   |
| 3.0                               | 9.42                                   | 14.14  |
| 4.0                               | 12.57                                  | 25.13  |
| 5.0                               | 15.71                                  | 39.27  |
| 6.0                               | 18.85                                  | 56.55  |
| 8.0                               | 25.13                                  | 100.53   |
| 9.0                               | 31.42                                  | 157.80   |
| 12.0                              | 37.70                                  | 226.20   |
| 18.0                              | 56.55                                  | 508.94   |
| 24.0                              | 75.40                                  | 904.78   |
| 30.0                              | 94.25                                  | 1413.70  |
| 36.0                              | 113.10                                 | 2035.80  |
| 48.0                              | 150.80                                 | 3619.20  |
| 60.0                              | 188.50                                 | 5654.80  |
| 72.0                              | 226.20                                 | 8143.00  |
| 84.0                              | 263.90                                 | 11,084.00  |
| 96.0                              | 301.50                                 | 14,476.00  |

*Example:*  
12 in. ID Chamber x 10 in. long  
12 in. ID Chamber = 37.70 sq. in./in. of length  
37.70 x 10 = 377 sq. in.  
Two 12 in. diameter flat cylinder ends = 226.20 sq. in.  
Surface Area of Chamber = 377 sq. in. + 226.2 sq. in.  
= 603.2 sq. in.

*Table 1. Surface Area Table for Determination of Chamber Surface Area*