03.13.20

Velocilinx
4280 Giddings Rd
Auburn Hills, MI 48326

INTRODUCTION

360° Product Testing has been retained to perform efficacy testing of a supplied, rechargeable Velocilinx Germinator UVC LED Handheld Sterilizer.

To determine sanitization efficacy, the UVC wand was used at 3-height levels to treat a glazed ceramic surface dosed with Escherichia Coli.

Device under Test

The UVC wand is a portable, rechargeable sterilizer. The device is of a plastic construction with a single button on the handle, and a side located child safety lock switch.

In order to activate the device, the button must be pressed twice and a chime is heard. Pressing the power button again turns the device off, and again a chime is heard. Small LEDs that surround the button also give indications on working status:

Charging / Low Power = Flashing Pulsing Red Light,
Stand-by = Dimming White Light,
Working = Pulsing White light pulsing,

Figure 1: Status light indicators for UVC wand

A hinge at the end of the device allows the device to be folded closed and flipped open. Flipping open the device reveals the UVC LEDS, 20 in total, 10 per column. A prominent warning label advised to no look directly into the UVC LEDS when on. A safety feature is built in to the device that prevents the device from powering on when the LEDS are aimed up, i.e., at the user.

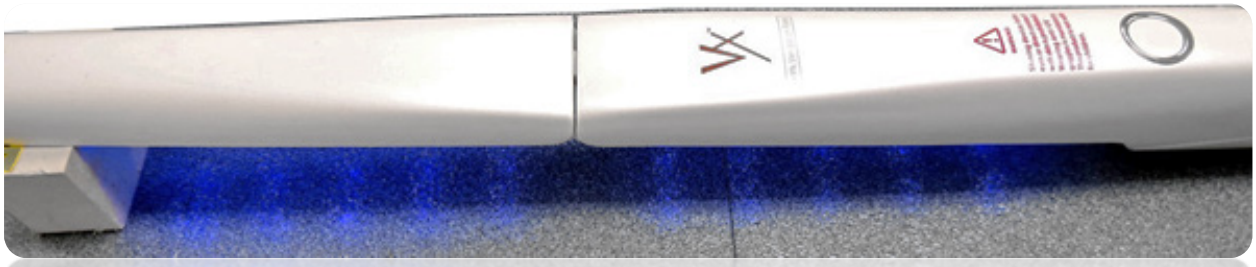


Figure 2: UVC Wand when activated

Test Process and Findings

Prior to testing, Escheria Coli bacterium were placed on nutrient agar petri dishes and incubated for 24-hours. Resultant colonies were used to swab onto a sanitized glazed ceramic tile. The tile's right side was control, and the left was treated with the Velocilinx Germinator Wand.

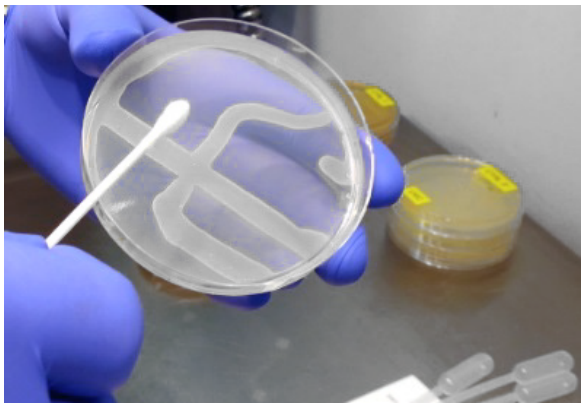


Figure 4: E. Coli colonies post incubation

To create a homogenous layer of E. Coli contaminant, the application swab was spread in a continuous, repeated motion back and forth, over two adjacent rectangles marked in black, each 3/8" x 1", and 1/2" apart from one another.

Prior to UVC treatment, the contaminated black rectangular area on the control side of the tile was wiped left-to-right in a single motion, and then wiped on the top portion of a sterile nutrient agar petri dish. Using the wiping swab, three lines the length of the dish, vertically separated from one another by roughly 5/16" were made on the agar.

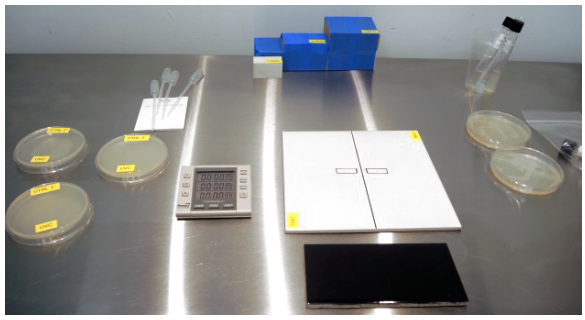
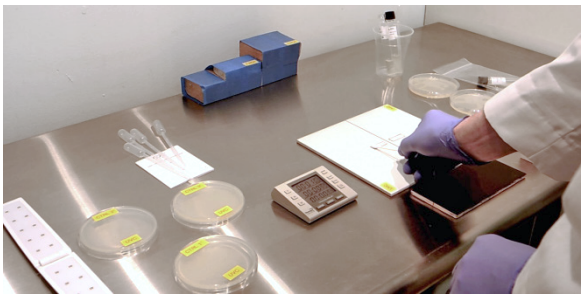


Figure 4: Ceramic tile with marked rectangles

After 1-minute treatment with the Germinator UVC LED Sterilizer, the tile's UVC side black rectangular area was also swabbed using an equivalent process. That UVC side swab was placed on another set of three lines on the bottom portion of the same petri dish as above.



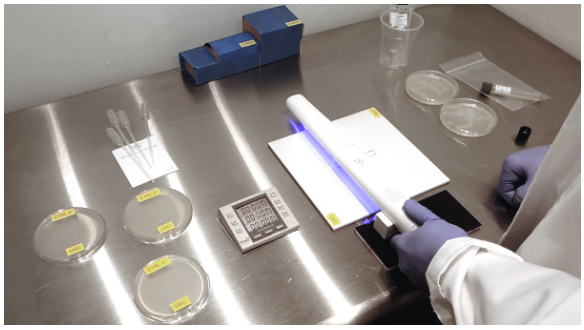


Figure 5: Ceramic tile being dosed with E. Coli and then being treated with the UVC wand.

The treated side of the tile received 1-minute exposure to the powered Velocilinx Germinator. The described process was repeated for each of three heights, i.e., 1", 2" and 3".

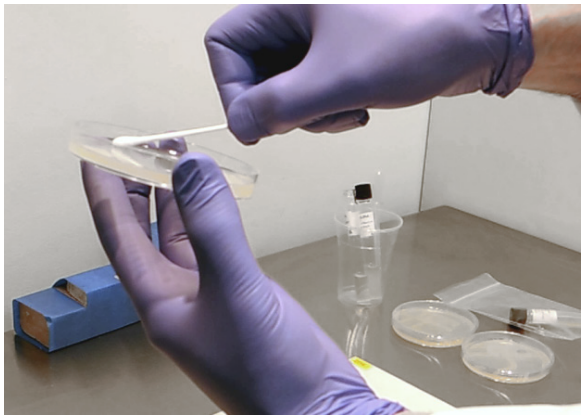


Figure 6: A swabbed tile being plated on a petri dish

After plating the tile swabbed contents on the petri dishes, the dishes were incubated for 24-hours.

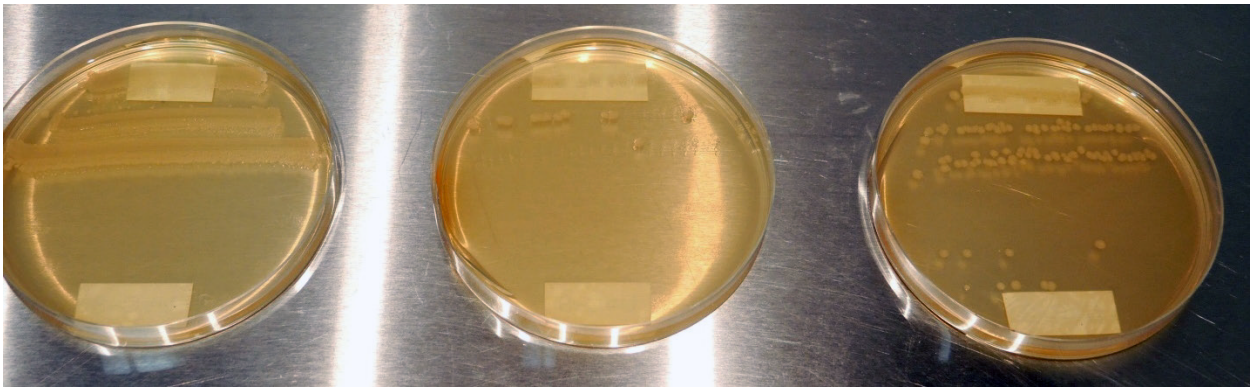


Figure 7: E. Coli colony growth on the petri dishes after 24-hours incubation.

Top of the dish was swabbed using the untreated, control side rectangle area. Bottom of the dish was swabbed using the UVC treated rectangle area.

Above left-to-right: Germinator UVC wand at 1", 2", and 3" above the contaminated tile.

In **Figure 7**, the upper portions of the petri dishes show that the untreated portions of ceramic tile had many viable E. Coli bacterium that formed colonies on the agar (i.e., patchy white dots).

At the 1" and 2" treatment heights (i.e., the two left dishes), no E. Coli colonies formed at the bottom of the petri dishes. This indicates that no E. Coli were viable after 1-minute treatment with the UVC wand at those heights.

At the 3" treatment height (Figure 7's far right petri dish), roughly 139 colonies grew on the control, top portion of the agar plate. Only 9 colonies grew on the UVC treated bottom portion. This indicates roughly 93.5% of the E. Coli were no longer viable after 1-minute treatment with the UVC wand at the 3" height.

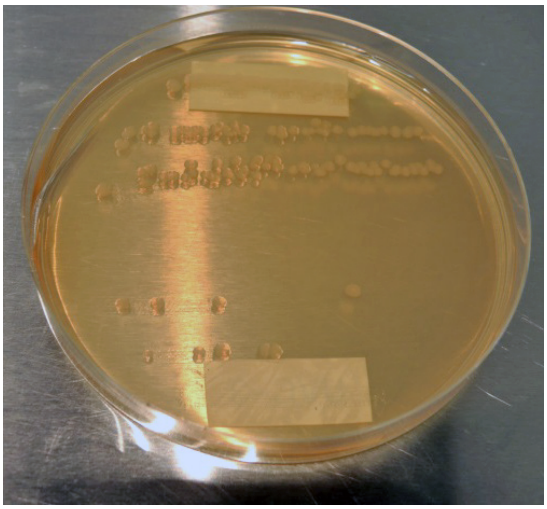


Figure 8: E. Coli growth on plate, control vs sanitized at a height of 3".

Conclusion

- After a 1-minute treatment at the height of 1" and 2", the Velocilinx Germinator handheld UVC sterilizer demonstrated 100% efficacy at killing E. Coli bacterium.
- After a 1-minute treatment at the height of 3", the Velocilinx Germinator demonstrated ~93.5% efficacy at killing E. Coli bacterium.

Reviewed By: KDM RNS