



FINAL REPORT

Efficacy Study of UVC LED Cap

ORDER Number
152101791

PREPARED FOR:

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Certificate of Analysis

Client: Microlyscs

Contact: Rakesh Guduru

Project: Efficacy study of UVC LED Cap against *Salmonella enterica*

Product: UVC LED Cap

EMSL NO: 152101791

Sample received: 3/18/2021

Report date: 3/29/2021

Challenge Bacteria: *Salmonella enterica* (*S. enterica*) – ATCC 1045

Experimental Summary:

The testing procedure was designed after discussions between EMSL Analytical, the testing company, and the client, Microlyscs, LLC. The testing was conducted on a UV light bottle cap, UVC LED, for its ability to kill bacteria in the contained water.

Procedure:

Bacterial Inoculum Preparation

A *S. enterica* stock culture was plated onto Tryptic Soy Agar with 5% sheep Blood (TSAB) and incubated at 35°C for 22 hours. Well-isolated colonies were then harvested, suspended in phosphate buffered water (PBS) and vortexed for 1 minute to ensure homogenization. This suspension was used to inoculate 450 mL of sterile DI water for each replicate to test in the prototypes.

Efficacy Testing

The 450-mL contaminated test water was placed into the container and capped with the UVC LED cap then treated with UV according to the following protocols:

- 1) Normal mode once (1 min exposure) and normal mode a second time (2 min exposure)
- 2) Crazy mode once (2 min exposure) and Crazy mode a second time (4 min exposure)



Following each treatment a small aliquot of water was removed and serially diluted in PBS for plating. *S. enterica* was plated onto AC Petrifilm plates and incubated at 35°C for 24 hours. After incubation any recovered colonies were counted.

Experimental Results:

Table 1: Quantitative counts for *S. enterica* contaminated water treated with the UVC LED Cap.

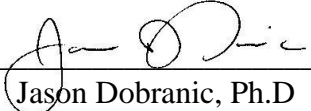
Time Point (minutes)	CFU/mL	Log	Log Reduction	%Kill
0 (normal control)	42,000,000	7.623		
Normal mode (1 min)	920,000	5.964	1.66	97.8
Normal mode (2 min)	4,500	3.653	3.97	99.99
0 (Crazy control)	49,000,000	7.690		
Crazy mode (2 min)	64,000	4.806	2.88	99.9
Crazy mode (4 min)	10	1.000	6.69	99.99998

Limit of detection = 10 CFU.

% Kill = Percent difference between starting population and device-treated population.

Conclusions:

The UVC LED cap significantly decreased the level of bacteria in the contaminated water after 2 minutes of treatment on the Normal mode and after 2 and 4 minutes on the Crazy mode compared to the starting bacterial populations.



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