EP Lighting, Inc.

Case Study: Dental Clinic

UV-KLEEN™ is the mobile unit presented by EP Lighting, Inc. that utilizes powerful UV irradiation and permeating controlled ozone production to disinfect every nook and corner of your facility. UV-Kleen™ is well-tested and validated at Washington University School of Medicine in St. Louis, the top sixth medical school in the United States. UV-KLEEN™ can kill bacteria, viruses and fungi by 99.99% within a few minutes, and it can be used in any industry for comprehensive disinfection. UV-KLEEN™ can be deployed in hospitals, clinics, nursing facilities, assisted living facilities, schools, colleges, airlines, buses, and corporate offices.

Here we discuss how the UV-KLEEN™ mobile unit is utilized at a dental clinic in Salt Lake City, Utah, USA, for disinfectant purposes. The product is scientifically tested to kill bacteria, viruses and fungi, in two different areas in the dental clinic. One area is 10x8x9 ft and the larger area is 20x15x9 ft.

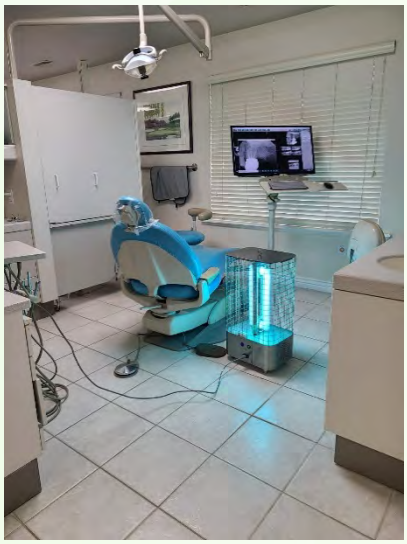
The following results show the time taken by UV-KLEEN™ to kill viruses and bacteria by 99.99%.

Parameters	Values
Dimensions of the room	10x8x9ft; 20x15x9ft
UV-KLEEN™ location	Center of the room
Temp and Humidity	71F; 55%
Time to achieve 50mJ/cm2	3 min at 6ft from the lamp source
Ozone Levels	0.9-1 ppm in 5 min at 6ft
Time to kill COVID-19	3 min @ 6ft surface 5 min @ 6ft air

50mJ/cm^2 is the required UV-C potency to disinfect a room from bacteria, viruses, and fungi by 99.99%. UV-KLEEN™ mobile unit could achieve 50mJ/cm^2 in 3 min when the dosimeter is placed at 6ft away from the lamp source. Most scientific studies on UV lamps are performed with the testing at 1ft from the lamp source. We decided to test our UV lamp at 6ft distance from the source. The Ozone levels are measured to be 0.9-1ppm in 5 min when measured at 6 ft.

The statistical published results demonstrate that Sars-CoV-2 (COVID-19) virus can be killed up to 99.9% by 10-20mJ/cm2 UV-C energy. UV-KLEEN™ achieved 50mJ/cm2, a much higher UV irradiation than

needed, under 3 mins, at 6 ft distance from the lamp source. UV-KLEEN™ also utilizes controlled ozone generation, which by itself is potent enough to kill bacteria and viruses by 99.99% in a few minutes.



While the UV-C lamp can disinfect surfaces and the air that is passed through the lamp, it has a shadow effect. Surfaces that are not directly in the line of the UV-C light are not disinfected. Pathogens in the shadows and nook and corners are not sterilized. On the contrary, ozone, because of its permeating nature, can reach every concealed or hidden area of the room, oxidizing (killing) the pathogens.

The ozone concentration is measured at 6ft from the source. At this distance, ozone concentration is found to be at 1 ppm in 5 min. In other words, it took 5 minutes to reach 1 ppm at a distance of 6 ft from the source in a large room. 1 ppm concentration will be achieved in a much shorter time in smaller rooms. 1 ppm ozone concentration is lethal for all the viruses, including COVID-19 virus, and all the bacteria in the air and on the surfaces.

Based on the above results, we conclude the UV-KLEEN™ mobile unit took 3 min to disinfect the surfaces, and 5 min to disinfect the air in a dental office. The remaining ozone took 4 mins to dissipate to under 0.4 ppm, OSHA recommended safe level to occupy the room.

UV-C light in combination with ozone, is highly potent to kill bacteria, viruses, and fungi. While UV-C light is potent enough to kill all the pathogens, there is a shadow effect. UV-KLEEN™ utilize controlled ozone generation to have a synergistic effect and to disinfect all the pathogens in every nook and corner.