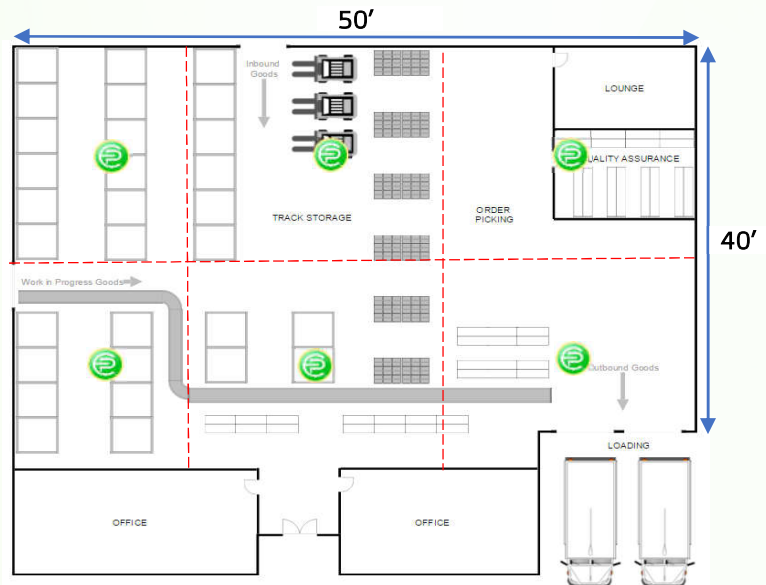


Case Study: Warehouse

UV-KLEEN™ model UVK-PRK-300W-O is installed at a warehouse for disinfectant purposes. The following results show the time taken by the UV-KLEEN™ system in killing the virus and bacteria by 99.99%. The warehouse is a large 2000 sq ft. facility with a 25 ft. high ceiling.

The warehouse is a large high ceiling space and loaded with heavy machinery, hidden shelves, stock rooms, pallets of packing material, and other manufacturing material. It is extremely difficult to reach Ozone at every corner of the warehouse when the UV-KLEEN™ is placed at a single location. Therefore, the UV-KLEEN™ is moved around the warehouse to 6 different preselected locations to reach a 1 ppm level of ozone at every corner. Each location is approximately 10 ft. away from the nearest wall or 20 ft. from other operating locations. The locations are chosen as shown in the following image. Dosimeters and Ozone are measured to be 50mJ/cm² and 1ppm respectively at each of the 6 locations.



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Parameters	Values
Dimensions of the room	50 x 40 x 25 ft
UV-KLEEN™ location	On the floor
Temp and Humidity	76F 23%
Time for 50mJ/cm ²	3 min at 5ft 6 min at 10ft
Ozone Levels	1ppm in 7 min @ 10ft
Time to kill Covid19 at each location	6 min @ 10ft Surface 7 min @ 10ft air
Total Time for Disinfecting warehouse	45-50 min for surface and air

50mJ/cm² is the required UV-C to disinfect a room up to 99.99% from viruses and bacteria. The UV-KLEEN™ achieves 50mJ/cm² in 6 min when the dosimeter is placed at 10 ft. distance from the lamp source. The Ozone levels are measured to be 1ppm in 7 min when measured at 10 ft. from the UV-KLEEN™ system.

The statistical published results state that Sars-CoV-2 (Covid19) requires 2.7mJ/cm² for a 90% kill rate, and approximately 10-20mJ/cm² for a 99% kill rate. The UV-KLEEN™ system achieved 50mJ/cm², a much higher UV irradiation to kill Covid19 in under 6 mins at 10 ft. from the lamp source.

While the UV can disinfect surfaces and the air that is passed through the lamp, Ozone is more beneficial to use when certain hidden areas require sterilization. Ozone can reach every concealed or hidden area of the room, oxidizing (killing) the pathogens. The Ozone is measured to be 1ppm in 7 min at 10 ft. measured in a hidden area behind a piece of equipment in the warehouse, where the UV light cannot reach. In other words, it took 7 mins to reach 1ppm at a distance of 10 ft. from the source. Ozone at 1ppm is a lethal dose for many viruses including Covid19 and other bacteria in the air.

With the 6 measured locations, adding transit setup time between the measured locations, the total disinfectant time for the warehouse is 45-50min. The facility manager also reported a "fresh, clean, odor-free" environment after sterilization. Manager adds " I now feel more confident that we are "clean and virus-free".

