



EP Lighting, Inc.

Case Study: TAK (TransportAirKleen) using ATP Luminometer

TransportAirKleen (TAK) is a 40W UV-KLEEN series designed for the transportation industry. TAK is a combination of high-intensity UVC, TiO_2 , and Negative ionizer technologies, efficiently designed to install in any automobile, such as ambulances, schools buses, trams, vans, and other vehicles.

During the pandemic, the industry developed many of its self-regulated standards for hygiene and cleanliness. ATP (Adenosine Triphosphate) measurement using Luminometer was a standard practice in food processing industries to measure its cleanliness. In recent times, ATP Luminometer is widely used in the hotel industry as well, to check whether the environment has been properly cleaned.

ATP is a molecule found in all living cells and it is responsible for transferring and storing energy. ATP levels act as an indicator of whether your environment has been properly cleaned. ATP Luminometer shows the results in RLU (Relative Light Unit). Higher the RLU the dirtier the surface is. EP Lighting Inc used industry-proven SystemSURE Plus™ Luminometer by Hygiena™ to measure ATP at its customer locations.

Principle of operation: TAK uses three sophisticated technologies to deactivate bacteria, viruses, and other pathogens from the vehicle. They are

- 1) UVC – Powerful UVC design with the patented induction ballast technology
- 2) TiO_2 – Special formulated TiO_2 from the labs of Japan, in creating high volume OH radicals
- 3) Negative Ionizer – To make the air crisp and fresh from odors

TAK uses a powerful 106CFM fan to pull contaminated air into itself, instantly disinfecting and releasing sterilized air back into the vehicle. TAK also releases OH radicals and negative ions into the vehicle, which constantly deactivate the bacteria and other viruses.

Both the TiO_2 and UVC are tested to deactivate the Covid19 virus by 99.99% at Washington University School of Medicine, #8th medical school in the USA.

Test Data: The following data is measured in a closed 50sqft (same size as a large car), and air circulated 160 sqft (same size as a mini schools bus).

Location #	Initial RLU	Final RLU				Area of room	Notes
		30 Min	60 min	70 min	%ge reduction		
1) Floor	865	442			49%	50 sqft	Surface disinfection through OH radicals
2) @34 inch height	3582	1665			54%	50 sqft	
3) Chair Arm	2210	457			79%	160 Sqft	
			2709		-23%		
				892	60%		
4) Floor	1026	523			49%		
			1031		0%		
				436	58%		

Table 1: Reduction of ATP values using TAK40 at different locations.

The TAK is turned off at the 60th minute. The data is collected at 30th min, 60th min, and 70th min (10 minutes after turning off the TAK unit).

Observations:

The TAK unit significantly reduced the ATP count in both locations, at all measuring points.

- 1) TAK was able to pull air into the unit and disinfect the air using its UVC light.
- 2) The OH radicals were able to reach 34-inch height without any additional fan support.
- 3) The OH radicals are constantly reducing the ATP level, even after the TAK is turned off, indicating that the OH radicals are spread apart with their half-life.
- 4) The increase in ATP levels at 60th minutes is attributed to the HVAC air pumped into the room.
- 5) It only took 10 minutes (from 60th to 70th minutes) to see a reduction in the ATP value.

Somewhere close to the 60th minute, the HVAC kicked in circulating the air within the room, resulting in bringing more pathogens from other rooms into the test area. Therefore, increased ATP is measured at 60th minutes. However, the OH radicals that are presented in the room are continuously disinfecting the room to reduce the ATP to a significantly lower level at the 70th minute.

Conclusion:

ATP meter is widely used in the hotel, restaurant, travel industries to check the cleanliness of the facility. OH radicals generated by the TiO₂ layers are continuously deactivating the surfaces, while the air is pulled into the TAK unit and being disinfected using the 40W UVC lamp. It is also observed that the disinfection rates keep improving even after the units are turned off until the OH radicals are completely dissipated. The vehicle is either pulling its air from outside or recirculating the inside air. In both these cases, the TAK unit is efficient in disinfecting the air and surface.

If you have any questions about this report, please contact us at info@uvkleen.us or info@eplightinc.com