

Re: UVC Light Effects on Small Electronic Devices

From: Dr. Wayne Clark., Ph.D. Electrical Engineering, Plasma Physics and Nuclear Fusion Research

To whom it may concern:

I have been involved over the past 30 years in research and development of intense ultraviolet sources and using that UV energy for antimicrobial applications. The technology that is presently being used in the Germicidal Enclosure “UV Box” is the same technology that I developed for the United States Department of Defense as part of the “Immune Building Program” to protect against bio agent attacks. This technology was researched and developed through a DARPA grant and is currently installed in the HVAC of the United States Pentagon providing air sterilization. The UV Box small device uses the same technology based on photon multiplication that uses a low energy UV to achieve the killing efficacy for C.difficile spores and other potentially deadly pathogens.

The question has been asked many times as to the effect of UV-C on electronic devices such as mobile phones, Tablets and other sensitive medical devices. To answer this, it is important to understand Ultra-violet light and the average intensity used for disinfection. The basic fact is that 254 nm UV light that is typically used for pathogen disinfection has a very short penetration depth into almost all materials. For example, the penetration depth into metals is essentially zero. On the other hand, the penetration depths for plastics and ordinary glass materials are less than a few thousandths of an inch or immeasurable. The only materials that transmit wavelengths near 254 nm even short distances are a couple of very special pure quartz or sapphire materials. These materials are used for the envelopes of the UV-Box’s lamps. AUVS also uses a pure quartz material for the rods in the AUVS Germicidal Enclosure “UV Box” to eliminate obstruction of the UV-C light while supporting the objects that are being disinfected.

The electronics in phones and electronic devices are located inside metal, glass and plastic enclosures. So, as a result, the UV-C can't penetrate the enclosures of electronic devices to reach the electronics. The electronics are totally shielded from the UV-C light. In addition, even if the UV could reach the electronic circuits inside the device enclosure, the photon energy of 254 nm UV-C is too low to damage semiconductors, printed circuits, etc. UV-C light wouldn't cause damage to the electronic circuits even if it could reach them. But, again, the electronic circuits are shielded from the all UV light. Therefore, UV generated by the AUVS UV-Box and other similar devices cannot damage electronics placed within it.

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