

# UV-CLEAN: SUMMARY OF SAFETY AND FACTS

**Summary:** UV-Clean was specifically created to protect humans from harmful viruses and bacteria while keeping safety as the accompanying goal of all product development. This document will outline the safety/facts regarding the technology and design of UV-Clean. Whether it is the most vulnerable of our society such as a newborn baby in the NICU or a shopper at a grocery store, UV-Clean is a proven safe product to use in close-proximity to human beings.

Below: UV-Clean being utilized in the NICU



**Facts:** The National Institute for Occupational Safety and Health (NIOSH) recommends that the time of exposure to an intensity of 100 uW/cm<sup>2</sup> (microwatts per square centimeter) at wavelength 254 nanometers not exceed one minute (60 seconds); and based on the NIOSH recommendation, the maximum time to be exposed of 30 uW/cm<sup>2</sup> should not exceed 200 seconds during an eight-hour period. An exposure of 1 uW/cm<sup>2</sup> should not exceed 6000 seconds (100 minutes) in an eight-hour period.

We have tested the UV-24 motion sensor at various heights and angles to determine possible exposure and to test the effectiveness of the motion sensor. The motion sensor is designed to turn off the bulb prior to getting into any area of where there is active disinfection taken place. Tests were performed at 9 different distances (ranging 3" to 14') and 7 different angles of approach to the unit. A UVC sensor was attached to a hand to measure effective intensity (uw/cm2) from the UVC light.

**Data:**

INTENSITY UW/CM2	OCCURRENCE
0	10
1	15
2	13
3	10
4	12
5	19
6	5
7	4
8	1
9	1

AVERAGE OF 10 TOUCHES. UW/CM2 AT 9 DIFFERENT ANGLES		
4.4	3.7	4.1
2.5	2.8	4.3
2.1	2.6	2.4

The results show that the maximum intensity from the never exceeded 9 uw/cm2 and there were only two occurrences of an intensity equal or above 8 uw/cm2.

The average intensity of the 90 occurrences was 3.21 uw/cm2.

Based on the average the maximum number of interruptions during an 8 hour period, to stay below the recommended exposure levels, is 1869.

The following default settings of the unit make this an impossibility.

3 minutes clean time  
15 seconds no motion time  
60 minutes wait time

It is important to note that exposure to UVC will only happen if the unit is actively disinfecting. Any motion within the field of disinfection will prevent the unit from turning on. In addition, if there is a 3.25 minute lag after the last usage, the unit will not be running and no exposure will occur.

PERCENTAGE OF NIOSH RECOMMENDED DOSAGE	NUMBER OF INTERRUPTIONS / 8 HOURS	NUMBER OF INTERRUPTIONS / HOURS	INTERRUPTIONS / MINUTES
10%	186.9	23.4	0.4
20%	373.8	46.7	0.8
30%	560.7	70.1	1.2
40%	747.7	93.5	1.6
50%	934.6	116.8	1.9
60%	1121.5	140.2	2.3
70%	1308.4	163.6	2.7
80%	1495.3	186.9	3.1
90%	1682.2	210.3	3.5
100%	1869.2	233.6	3.9

The table above shows the exposure likelihood of the unit. Based on the testing, the chances of exposure above 20% during an 8-hour period is extremely unlikely. This would involve an average over 47 customer engagements in 1 hour **and during all those engagements, the UV-Clean would need to be actively disinfecting.**

#### Key Safety Results:

1. Any human exposure to UVC light via UV-Clean is **substantially** below any dangerous levels to human beings.
2. The UV-Clean motion detector is effective in preventing even **minimal** exposure to UVC light.
3. The **angle of the UV-Clean solution** is pointed **down** and safely away from the human eye.
4. If for any reason the UV-Clean solution malfunctions for any reason, the solution can be **easily unplugged** and replaced/repared within (24) hours.

While this document is meant to address the facts/safety surrounding the UV-Clean solution and the utilization of UVC light to eradicate harmful viruses and bacteria, additional scientific studies can be provided upon request.



The CDC supports UV-C disinfection in Hospitals and has sponsored/published various studies and articles on the subject [i].

In March 2020 the FDA released Guidance for Industry and Food and Drug Administration Staff where they identify UV-C light to produce a germicidal effect [ii].

UV-CLEAN, and all UV disinfection devices, are regulated by the Environmental Protection Agency (EPA).

ENS has verified the content of this document and all information is accurate as of April 2020.

ENS is proud to contribute valuable technology in the fight against COVID-19 along with other harmful pathogens. We look forward to helping you keep your customers and employees safe.

Sincerely,

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#### References

[i] Anderson DH, et al., 2013. New CDC Study Confirms Effectiveness of UV-C Disinfection to Combat Harmful Pathogens. <https://www.infectioncontroltoday.com/environmental-hygiene/new-cdc-study-confirms-effectiveness-uv-c-disinfection-combat-harmful>

[ii] U.S. Department of Health and Human Services Food and Drug Administration. Enforcement Policy for Sterilizers, Disinfectant Devices, and Air Purifiers During the Coronavirus Disease 2019 (COVID-19) Public Health Emergency. March 2020 <https://www.fda.gov/media/136533/download>