



CleanRide  
UV-C

MADE IN  
NORTH AMERICA



## Vehicle UV-C LED System

Kills 99.9% of Viruses\*  
in Multi-User  
Vehicles

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video



### Tested & Proven to Kill 99.9% of \*SARS-CoV-2

With SARS-CoV-2 being recognized as an airborne contagion, and with many industries dependent on multi-user vehicles in their daily operations, new cleaning considerations are now required to not only include surfaces, but also the exchange of air in small spaces to help protect the health, safety and confidence of your employees; and help ensure the safest possible working environment for all staff.

Understanding these new challenges, and specifically the challenges related to safe vehicle operations, Team Eagle has designed “CleanRide UV-C™”, a medical grade LED light system for multi-user fleet vehicles and maintenance equipment.

- Cleans air and most surfaces within 5-35 minutes – timing is dependent upon size/type of vehicle
- Integrated timer display for ease of use and operator safety as a top priority
- Portable from vehicle to vehicle
- Additional warning lights installed to protect operators and users
- UV-C does not escape from the vehicle windows/glass, and is safe to be outside the vehicle
- Safely turns off/on from outside the vehicle to eliminate any operator risk
- Standard plug-in to a vehicle's 12-24v DC
- Light reaches maximum output immediately and holds consistent for entire duration
- Customized case designed by Team Eagle Ltd. to help protect the light for working airfield conditions
- Thoroughly tested and proven
- Easily mounts to glass surfaces using operator friendly and industrial grade suction cup
- Manuals and best safety practices provided for ease of use

Providing managers  
peace-of-mind  
in keeping crews  
healthy and safe



## UV-C LED Light for Multi-User Vehicles

With access to a body of scientific research into the effectiveness of UV-C LED lights, there are many proven benefits to its use for not only disinfecting surfaces, but it can also ensure the cleaning of AIR. UV-C light is used in the treatment of drinking water and decontamination of ambulances and hospital rooms. UV-C can also be effective for disinfecting many small areas such as vehicles; and has been tested to ensure the UV-C light is blocked by normal glass.

- 48 LED Lights
- Wattage - 50 W
- -40°C TO 40C Operating Range
- 275nm Wavelength
- Voltage = 120V
- Simple ON/OFF Switch & In-vehicle Plug



Specifications/studies supporting UV-C Light disinfecting capabilities are available online or by request.

*Precautions for UV-C Light: Never have persons present in the vehicle while the light is operating BE AWARE: CleanRide UV-C™ DOES NOT GIVE OFF VISIBLE LIGHT. RED warning LEDs inform users when light is energized.*



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**HEAD OFFICE**  
2200 Keating Cross Rd., Unit E,  
Victoria, BC V8M 2A6  
Phone: (250) 652-5266  
Fax: (250) 652-4700  
Toll-Free: 1-866-652-2877  
sales@mdcharlton.ca

**WESTERN CANADA**  
BC Mainland,  
Yukon, NW Territories  
20253 Fraser Highway,  
Langley, BC V3A 4E7  
Phone: (604) 534-1588  
Fax: (604) 534-6899  
saleswest@mdcharlton.ca

**PRAIRIES**  
Alberta, Saskatchewan,  
Manitoba  
Phone: (306) 445-2286  
Fax: (306) 445-4801  
Toll-Free: 1-866-652-2877  
salescentral@mdcharlton.ca

**ONTARIO**  
4100-B Sladeview Cres., Unit 4,  
Mississauga, ON L5L 5Z3  
Phone: (905) 625-9846  
Fax: (905) 625-3538  
Toll-Free: 1-877-993-9968  
ontariosales@mdcharlton.ca

**OTTAWA**  
66 Iber Rd, Bldg A, Unit 103  
Stittsville, ON K2S 1E8  
Phone: (613) 599-3950  
Fax: (613) 599-3951  
federalsales@mdcharlton.ca

**ATLANTIC CANADA**  
Phone: (902) 405-8322  
Fax: (902) 405-8323  
maritimesales@mdcharlton.ca

**QUÉBEC**  
Phone: (905) 625-9846 ex 337  
Fax: (905) 607-7842  
quebecsales@mdcharlton.ca

[www.mdcharlton.ca](http://www.mdcharlton.ca)

# Lind Equipment - Lab Test Report

## Project Summary

Lind Equipment has contracted the ImPaKT Centre to conduct anti-viral testing with SARS-CoV-2 via viral titer reduction assays after exposure to UV-C light emitted from Lind Equipment's constructed device. Lind Equipment provided a UV-C emitting device on an adapted stand for testing within ImPaKT's CL3 laboratory. After consultation with Lind Equipment, ImPaKT moved forward with testing doses of 10, 15 and 30 mJ/cm<sup>2</sup> of UV-C. At all three doses of UV-C treatment, the SARS-CoV-2 viral titer was reduced by 4 Logs, equating to a 99.99% reduction of infectious virus. SARS-CoV-2 reported inactivation by the UV-C treatment, and the log reduction were limited by the starting viral titer.

## Experimental Method

### UV-C Equipment Setup

The UV-C light source was mounted on a bracket to allow the light source to sit within the CL3 biosafety cabinet (BSC). Viral supernatants (150ul) were placed into the center of a 60mm polystyrene plate placed approximately 18 inches below the lights source (Figure 1).



Figure 1. Lind Equipment UV-C Device in CL3 BSC.

### SARS-CoV-2 preparation and UV-C Treatment

The SARS-CoV-2 (WA1/2020) virus stock at a titer of 10<sup>5.8</sup> TCID<sub>50</sub>/ml was thawed and diluted, 150ul of the virus was added to the center of 60mm polystyrene dish approximately 18 inches below the UV-C device. A UV-C light dose detector was placed next to the 60mm dish and turned on. As instructed by Lind Equipment, the UV-C device was turned on and the UV-C detector was monitored. At the desired UV-C dose levels, the light source was turned off. This process was repeated three times to achieve the doses of 10, 15, and 30 mJ/cm<sup>2</sup>. UV-C treated viral supernatants were titered onto 20,000 Vero E6 cells in 96 well flat bottom plates to quantitate viral titer reduction as a result of exposure.

## **Results**

In Table 1, at all three doses of UV-C treatment, 10, 15, 30 mJ/cm<sup>2</sup>, the SARS-CoV-2 viral titer was reduced by 4 Logs, a 99.99% reduction of infectious virus. It should be noted that the virus inactivation could have been higher at all doses but the viral titer reduction was limited by the starting viral titer.

Table 1. Lind UV-C Viral Titer Reduction

Dose(mJ/cm <sup>2</sup> )	Viral Titer	Reduction Factor (Log10) v. Control	% Viral Reduction
10	10 <sup>0</sup>	4	99.99%
15	10 <sup>0</sup>	4	99.99%
30	10 <sup>0</sup>	4	99.99%

\*Control virus titer 10<sup>3.75</sup> TCID<sub>50</sub>/ml

## **Supplementary material**

List of study materials:

- Lind Equipment UV-C device
- SARS-CoV-2 (WA1/2020) (TCID<sub>50</sub>/ml 10<sup>5.8</sup>)
- VERO E6 cell line (*Cercopithecus aethiops*, kidney)
- Dulbecco's Modified Eagle media supplemented with 10% or 2% fetal bovine serum
- Polypropylene 1.5ml tubes
- 60mm polystyrene dishes
- 96-well flat bottom plates
- EVOS M7000 Microscope

# CleanRide Sales Support Document

## Elevator Pitch

- UV-C is the only technology out there that kills COVID-19 and other viruses/bacteria on surfaces **AND AIR**, as it has now been determined COVID-19 is an airborne virus that can remain in aerosol droplets in a room (vehicle) for several hours after an infected person leaves,<sup>1</sup> this is the largest factor.
  - Many may believe that electrostatic sprayers can accomplish this, please see notes on UV-C vs sprayers below
- Completely portable to be used on a variety of vehicles, and – if desired – building rooms
- CleanRide has been designed with the safety of the users as the top priority. UV-C light does not escape glass and the unit is designed to only be turned on once the doors are closed and windows are up using a remote on/off button and ample warning lights
- UV-C light will sanitize all surfaces that it comes into contact with, still need to wipe down shadow areas (back of steering wheel, cup holders, etc. – note if surfaces covered in dirt/contaminant, light will not reach)
- Priced competitively with industrial UV-C lights that come without the fans, timer, suction cup, remote buttons, DC adaptation, etc. (essentially only lights with exposed wiring sold)
- No need to purchase more chemical/boxes of wipes
- Safe for car interior (test notes below) and human contact inside vehicles immediately after use
- If time is an issue, two CleanRide units can be used and cut time required into ¼. (i.e., a vehicle that takes 10 minutes with one unit would take 2½ minutes with two units) and would also eliminate need to wipe down most shadow areas.
- Kills more than just COVID-19 (i.e., hepatitis, common flu, etc.) that may lie on vehicle surfaces – useful for when/if COVID leaves

## Frequently Asked Questions/Hurdles

### 1) *How do you know your UV-C unit kills COVID-19?*

There are several sources on the CleanRide website that link to articles/studies conducted by reputable sources that confirm that with a dosage level of 6mj/cm<sup>2</sup> to 22mj/cm<sup>2</sup> UV-C light COVID-19 is eliminated<sup>2</sup>. This technology is already being largely relied upon to clean hospital rooms where patients with COVID-19 have visited, and Team Eagle has spoken to University doctors who have worked with hospital to

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<sup>1</sup> <https://www.health.harvard.edu/diseases-and-conditions/coronavirus-resource-center>

<sup>2</sup> <https://www.cleanride.team-eagle.ca/>

integrate this technology, and they confirmed UV-C light at the above dosages will sterilize COVID-19.

The next step Team Eagle took was to ensure that the UV-C supplied to us for the CleanRide uses achieves the required dosages. Our goal was to ensure we were safely above the top level of required dosages (22mj/cm<sup>2</sup>). Using testing we confirmed our light could meet that dosage in the required time, and we then used the time it took to achieve that into account when setting out our required cab-size time chart. To be extra cautious, our dosage recommendation is higher than required at 25mj/cm<sup>2</sup>.

\*Note – As of 30/Sep/20 we are awaiting testing from Western University as our UV-C light supplier believes their LED UV-C lights can sterilize COVID-19 at around 10mj/cm<sup>2</sup>, however until this is confirmed by Western University, Team Eagle will not lower our guidelines from 25mj/cm<sup>2</sup>. **AS OF 3/DEC/20, WESTERN UNIVERSITY HAS CERTIFIED THIS TO BE ACCURATE/TRUE, CLEANRIDE KILLS COVID @ 10mj/cm<sup>2</sup>**

## 2) *We are using Sprayers now.*

- Contrary to what is becoming popular belief, electrostatic sprayers **DO NOT KILL COVID-19 IN THE AIR**. The design of these sprayers is to positively charge the droplets as they leave the unit, causing them to seek out surfaces and stick to them.<sup>3</sup>
  - This was a very good selling point at the beginning of the pandemic because it meant that rooms/hallways could be cleaned and quickly re-occupied. However as mentioned above and referenced in the Harvard University study, the air now needs to be cleaned and these sprayers do not accomplish that task.
- CleanRide has been tested and proven not to harm the interior of vehicles. Foggers/sprayers have been known to cause damage to car interior electronics.<sup>4</sup> This problem magnifies when inside fleet vehicles that typically have additional and expensive electronics in them (fleet radios, tough books, radar equipment, etc.)
- Though chemical company MSDS sheets vary, many are extremely dangerous (requiring PPE), and should not come into contact with human skin/eyes. Recommend asking customer if using, and if chemical states it eliminates COVID-19

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<sup>3</sup> <https://www.epa.gov/newsreleases/epa-takes-action-help-americans-disinfect-indoor-spaces-efficiently-and-effectively>

<sup>4</sup> <https://www.claimsjournal.com/news/national/2020/05/26/297233.htm>

- Sprayers are causing health issues, and are not always even effective for killing COVID-19 on surfaces, WHO recommends against using them.<sup>5</sup>
- Another potential risk to sprayers/foggers is freezing during winter operations
- The cost of the sprayer is at least (but usually more) than the listed CleanRide pricing. Sprayer chemical is also very expensive for refills

### **3) *We are using wipes.***

- In order to properly disinfect, wet wipes need to keep a surface wet for around 4 minutes<sup>6</sup>. (This is almost as long as the CleanRide unit requires, maybe longer pending cab size)
- Hospital cleaners, when wiping down surfaces, may only get 49% of the surface that require cleaning<sup>7</sup>. This percentage likely increases when being conducted by operators of vehicles who are not as conscientious as medical cleaners.
- Very high cost purchasing new and disposing of wipes.

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<sup>5</sup> [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200514-covid-19-sitrep-115.pdf?sfvrsn=3fce8d3c\\_6](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200514-covid-19-sitrep-115.pdf?sfvrsn=3fce8d3c_6)

<sup>6</sup> <https://laist.com/latest/post/20200328/coronavirus-how-long-does-a-disinfectant-wipe-work>

<sup>7</sup> <https://pubmed.ncbi.nlm.nih.gov/18171180/>