



# UV-C

## HIGH POWER

ULTRAVIOLET DISINFECTION SYSTEM

 **XtraLight**<sup>®</sup>  
LED Lighting **Solutions**

# Video link if using pdf

- <https://youtu.be/s72wu1ppBRk>



# // **BUY AMERICAN**

**WORKING HARDER. LIGHTING SMARTER.®**



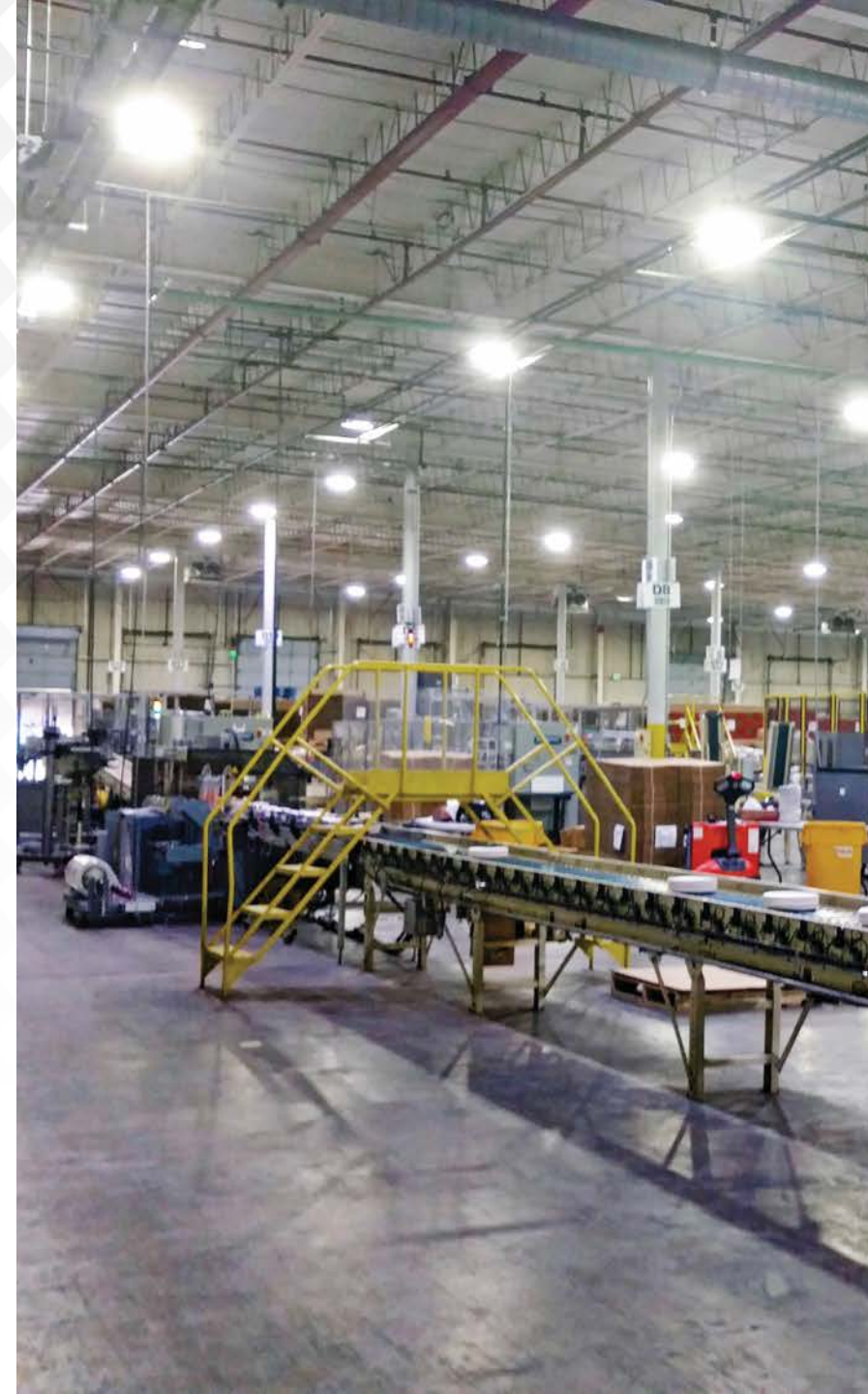




// **WE ARE XTRALIGHT®**

**WE ARE A VERTICALLY INTEGRATED,  
SINGLE SOURCE SOLUTION  
PROVIDER.**

**EXPERTS, DELIVERING EVERY STEP  
OF THE WAY, FROM CONCEPT TO  
COMPLETION, PROVIDING ALL YOU  
NEED IN SPECIFICATION GRADE  
LIGHTING.**







# // WE ARE THE LIGHTING EXPERTS

- **ENGINEERING**
- **TESTING**
- **MANUFACTURING**
- **QUALITY CONTROL**
- **ON-TIME DELIVERY**
- **ENERGY**





# // ULTRAVIOLET WAVELENGTHS

## UNDERSTANDING UV

### UVC Short wavelength

- 100-280 nm
- Shortest of all UV rays
- Medically categorized as germicidal
- Uses: ***Eliminate mold, viruses, and bacteria*** in the air & surfaces, disinfects drinking water & treatment of sewage

### UVB Medium wavelength

- 280-315 nm
- Increases Vitamin D in humans
- Use in short bursts to replicate sun's rays
- Uses: Photo therapy, skin treatment, and boost THC potency

### UVA Long wavelength

- 315 - 400 nm
- UV closest to the visible light spectrum
- Deeper penetration into the skin
- Uses: Tanning , treating skin disease, indoor gardening, eradicating bugs, improve air quality, object identification

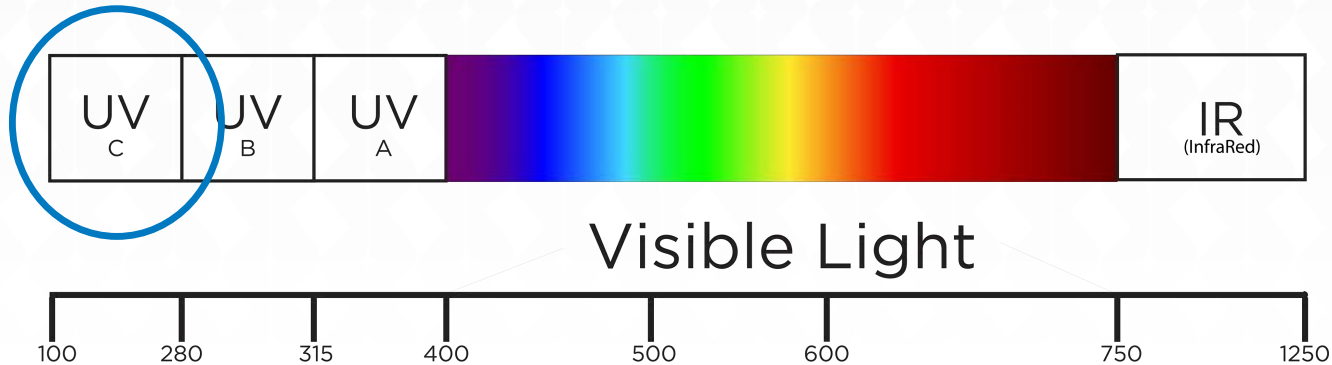






# // XTRALIGHT'S UV-C HIGH POWER DISINFECTION SYSTEM

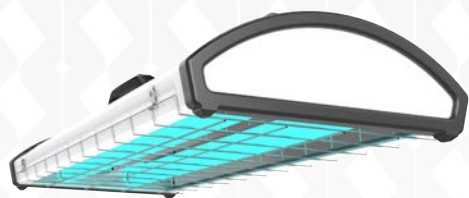
- **UV-C High Power Ultraviolet Disinfection Systems**  
Handheld (UVCH) and Mobile Unit (UVCM) use 254 nm wavelength.
  - **Germicidal** (UVC) range is between 100 – 280 nm
  - UVC damages RNA/DNA of microorganisms (virus, bacteria, protozoa, and fungi) resulting in **inactivation**



Approximately 90% of the energy generated by the UVC lamp is UVC wavelengths (non-visible). The remainder is a visible blue wavelength.



# // UV-C HIGH POWER ULTRAVIOLET DISINFECTION SYSTEM



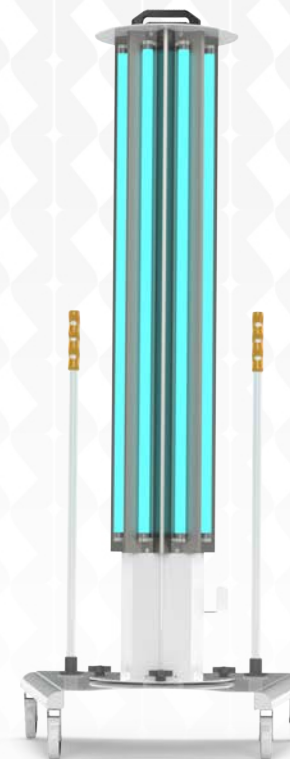
UV-C Handheld Unit

Handheld Unit

<i>Irradiance mJ/cm<sup>2</sup></i>	<i>Distance</i>
2.90	2 in.
2.80	4 in.
2.30	6 in.
1.75	8 in.
.97	12 in.
.75	18 in

Mobile Unit

<i>Irradiance mJ/cm<sup>2</sup></i>	<i>Distance</i>
.65	3 ft
.34	5 ft
.08	10 ft
.03	15 ft
.02	20 ft
.01	25 ft



UV-C Mobile Unit

- Effectiveness increases as processing time increases
- Effectiveness decreases as distance from the surface to the lamp increases
- Deactivate average virus and bacterium in 6 seconds @ 4 in. with handheld unit and 3 minutes @ 5 ft with mobile unit





# // UV-C HIGH POWER ULTRAVIOLET **DISINFECTION** SYSTEM **HANDHELD** SPEC SHEETS

- Portable handheld device to disinfect and rid spaces of microorganisms
- Uses two quartz glass germicidal UVC lamps with ceramic caps
- Easy UVC lamp change out
- Plastic formed comfort grip handle and additional grip
- 20 ft 5-15p power cord (standard on 120V)
- Mobile carrying case to hold device and PPE
- Lightweight and easy to use
- On/Off safety switch

## **Dimensions**

Length: 24 in.

Width: 9 in.

Height: 6 in.

## **Weight**

5.5 lbs. Shipping Weight: 22 lbs

## **UVC**

254 nm wavelength 40W

Irradiance: 2.8 mJ/cm<sup>2</sup> @ 4 inches

Produces no ozone or other secondary contaminants

## **Construction**

Lightweight aluminum housing with white antimicrobial polyester powder coat

Quartz glass germicidal UVC lamps with ceramic end caps and G13 sockets

## **WARRANTY**

Unit backed by XtraLight's UV warranty

## **Lamp Replacement**

For optimum results, replace UVC lamps after 9,000 hours or one year of operation

Contact factory for lamp replacement and pricing

## **Included:**

1 UV-C Disinfection System

1 Pair UV-C glasses with case

1 Pair UV-C gloves

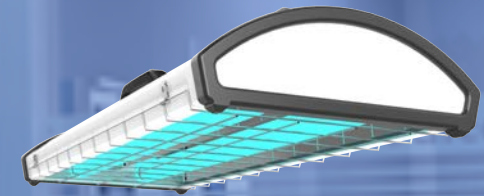
1 UV-C face shield

1 UV-C Warning sign

10 Dosimeter cards

1 Carrying case

1 window cling



**NOW TAKING ORDERS:**  
Item # UVCH240254WH



# // UV-C HIGH POWER ULTRAVIOLET DISINFECTION SYSTEM **MOBILE** SPEC SHEETS

- Mobile UV-C system to disinfect and rid spaces of microorganisms
- Uses eight germicidal UVC lamps with ceramic caps
- Easy UVC lamp change out
- Wheeled stand for easy placement of unit
- 20 ft 5-15p power cord (standard on 120V)
- Protective cover
- On/Off switch
- Secondary power switch with WiFi enabled timer and on/off settings controlled via IOS or Android App
- Occupancy sensor

## Dimensions

Center diameter: 12 in.

Height: 5 ft (includes base)

Base : L 30 in. x W 20 in.

## Weight

65 lbs. shipping weight: 140 lbs

## UVC

254 nm wavelength. 320W

Irradiance: .34 mJ/cm<sup>2</sup> @ 5 ft

Produces no ozone or other secondary contaminants

## Construction

Lightweight aluminum housing with white antimicrobial polyester powder coat

Quartz glass germicidal UVC lamps with ceramic end caps and G13 sockets

Base: Extruded aluminum with 4 locking caster wheels

## WARRANTY

Unit backed by XtraLight's UV warranty

## Lamp Replacement

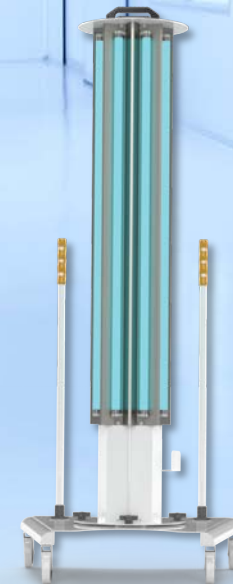
For optimum results, replace UVC lamps after 9,000 hours or one year of operation

Contact factory for lamp replacement and pricing

## Included:

- 1 UV-C Disinfection System
- 1 Pair UV-C Glasses with Case
- 1 Pair UV-C Gloves
- 1 UV-C Face Shield
- 1 UV-C Warning Sign
- 20 Dosimeter cards
- 1 Protective cover
- 1 Window cling

**NOW TAKING ORDERS:**  
Item # UVCM8320254WH







# // WHERE TO USE UV DISINFECTION SYSTEMS

## APPLICATIONS

### Education / Child Care

- Classrooms • Cafeterias
- Dorms • Restrooms
- Gymnasiums
- Locker Rooms



### Clean Rooms

- Labs
- Food Processing
- Storage Facilities
- Commercial Kitchens



### Retail / Office Space

- Pharmacies
- Warehouses • Elevators
- Common areas • Grocery Stores • Department Stores



### Hospitality/Hotel

- Cruise Ships
- Restaurants
- Convention Halls



### Public Transportation

- Buses • Airplanes • Passenger Trains • Train Stations • Airports
- Bus Terminals



### Recreation/Wellness

- Hospitals • Urgent Care
- Gyms • Spas • Salons
- Equipment Rooms
- Restrooms

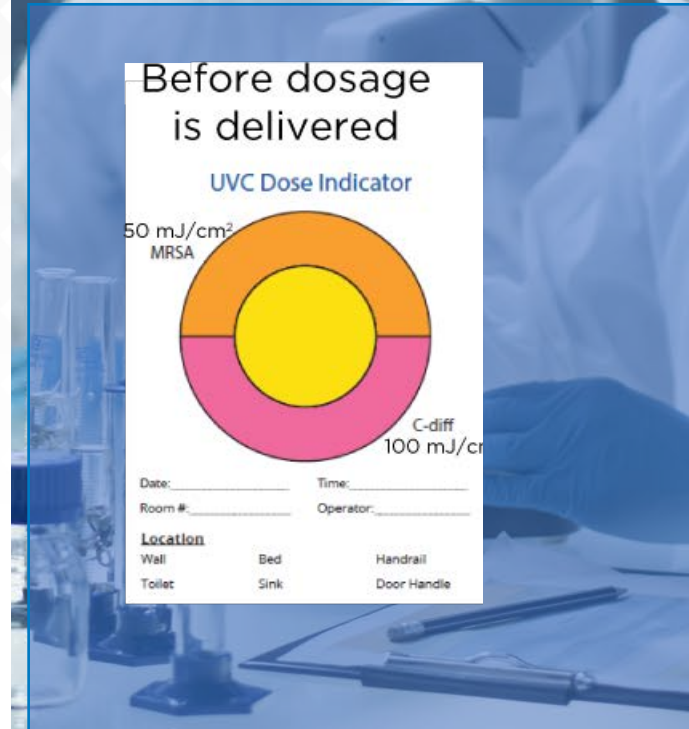






# // HOW TO KNOW UVC DISINFECTION WORKS THE EVIDENCE

- **Dosimeter Cards** validate dosage:
  - 50 mJ/cm<sup>2</sup> for MRSA, SARS
  - 100 mJ/cm<sup>2</sup> for C-diff
- Visible reduction in mold is seen in a very short period
- All line of site surfaces will start to look cleaner
- Odors are evident after initial treatment and disappear after multiple treatments
- Drain pans and water become significantly cleaner
- Indoor air quality (IAQ) is improved








# // HOW TO DETERMINE EXPOSURE TIME

## STEPS:

1. FOLLOW SAFETY GUIDELINES
2. UNDERSTAND BASIC UVC TERMS
3. IDENTIFY UV DOSE
4. SURVEY AREA TO BE DISINFECTED
5. CALCULATE ESTIMATED UV EXPOSURE TIME FOR DISINFECTING
6. DISINFECT AND VALIDATE WITH DOSIMETER CARDS



All surfaces within a certain distance will observe an assured level of disinfection in a certain amount of time as long as the wavelengths are not blocked from accessing the surface.



# //FOLLOW SAFETY GUIDELINES

## STEP 1

- Excessive exposure to UVC can cause adverse effects on the eyes, retina, skin, circadian system, and immune system
- Human over exposure causes temporary skin redness and harsh eye irritation
- Symptoms may take 4 to 24 hours to occur after exposure

### Do

- Protect your eyes
- Use protective PPE gear
- Establish a plan to disinfect area
- Use safety timers
- Train personnel in using UV-C disinfecting system
- Use hazard warning signs when in use
- Keep fixture in protective case

### Don't

- Don't expose eyes & skin to UVC
- Don't allow anyone to operate UVC fixture without reading safety instructions
- Don't allow anyone into area being treated with UVC
- Don't touch the UVC lamps while operating





# // PERMISSIBLE UVC EXPOSURE

- **Permissible** UVC exposure at 254 nm according to ACGIH
- Calculated permissible exposure for **UVC Handheld** from 5' to 40'

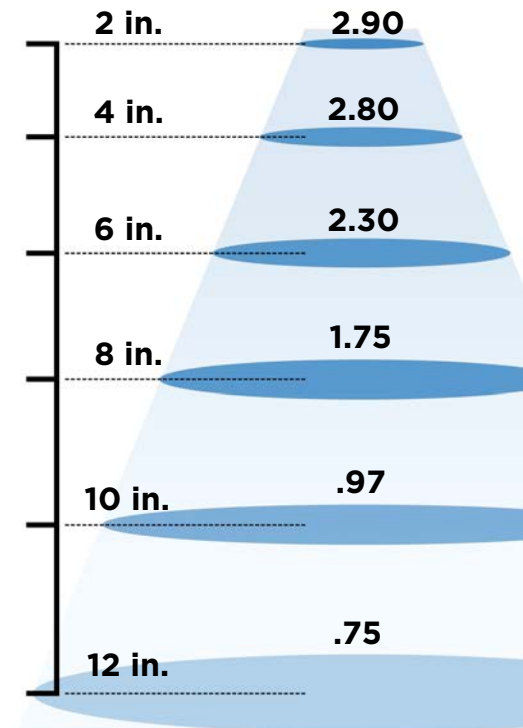
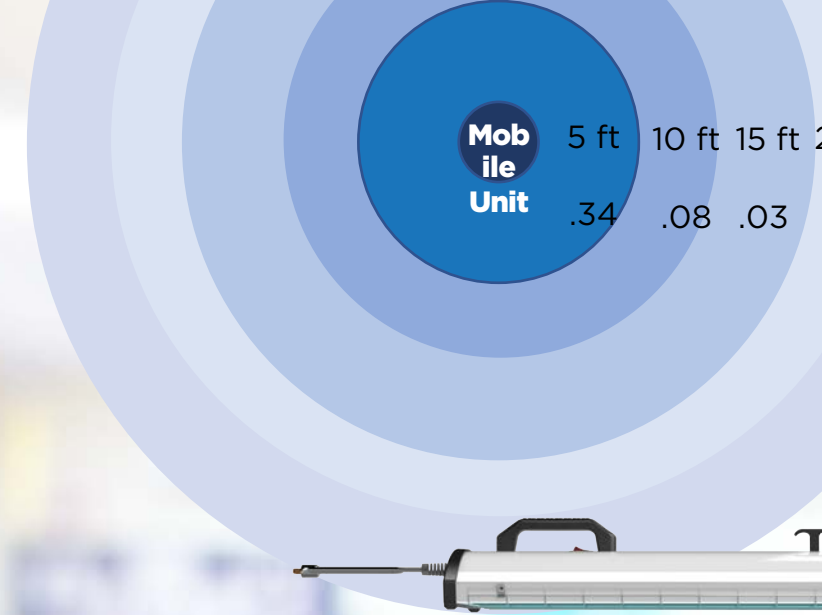
## PERMISSABLE UVC EXPOSURE

Duration of Exposure Per Day	Irradiance (mJ/cm <sup>2</sup> )	Handheld
8 hours	0.002	
4 hours	0.004	
2 hours	0.008	40 ft direct line of sight
1 hour	.017	
30 min	.033	30 ft direct line of sight
15 min	.066	
10 min	.10	
5 min	.20	5 ft direct line of sight
1 min	1.00	

### UVC Handheld Irradiance:

Distance	Irradiance
40'	.001 mJ/cm <sup>2</sup>
30'	.003 mJ/cm <sup>2</sup>
20'	.005 mJ/cm <sup>2</sup>
10'	.016 mJ/cm <sup>2</sup>
5'	.020 mJ/cm <sup>2</sup>

Above table from ACGIH compared to XLM handheld UV-C device







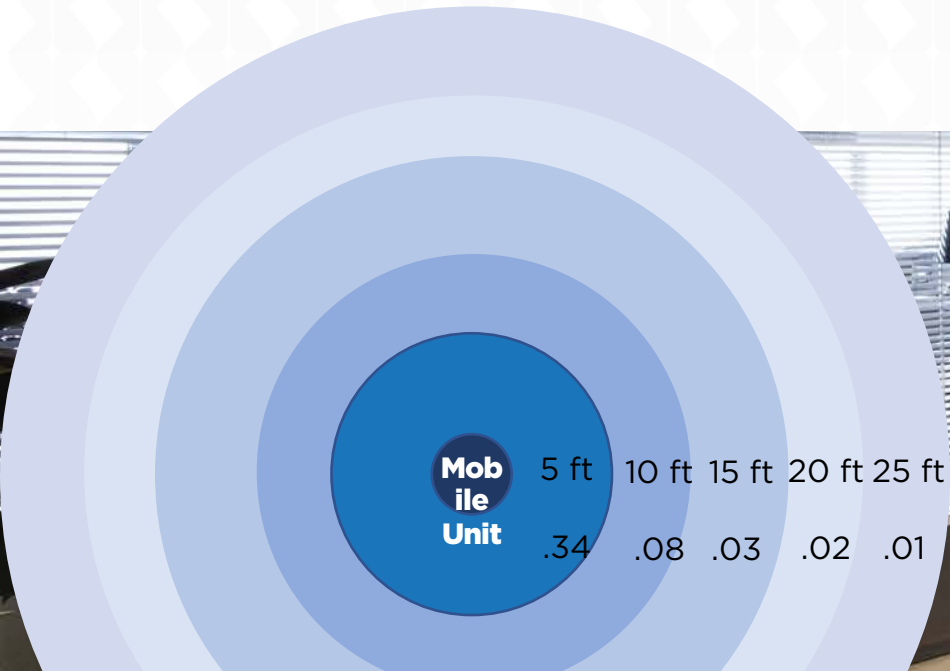
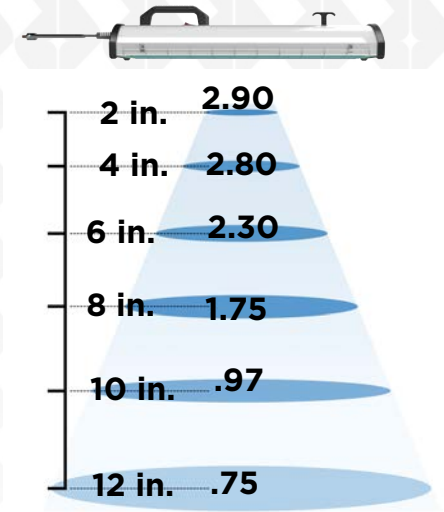
# // UNDERSTAND BASIC UVC TERMS

## STEP 2

- **RADIANT EXPOSURE** = expressed as **J/m<sup>2</sup>** or **mJ/cm<sup>2</sup>**
- **UV INTENSITY (I)** = **intensity of radiation measured** in the units of mJ/cm<sup>2</sup>.
- **EXPOSURE TIME (T)** = amount of time to disinfect a target area express in seconds
- **UV DOSE (FLUENCE)** = UV Intensity (I) x Time (T) expressed as mJ/cm<sup>2</sup>
- **LOG REDUCTION** = percentage of microorganisms inactivated

example:

a 1 log reduction will reduce the pathogen by 90%,  
a 2 log reduction will reduce the pathogen by 99%, etc...



Log Reduction	Reduction Factor	% Reduced
1	10	90%
2	100	99%
3	1000	99.9%
4	10,000	99.99%
5	100,000	99.999%
6	1,000,000	99.9999%



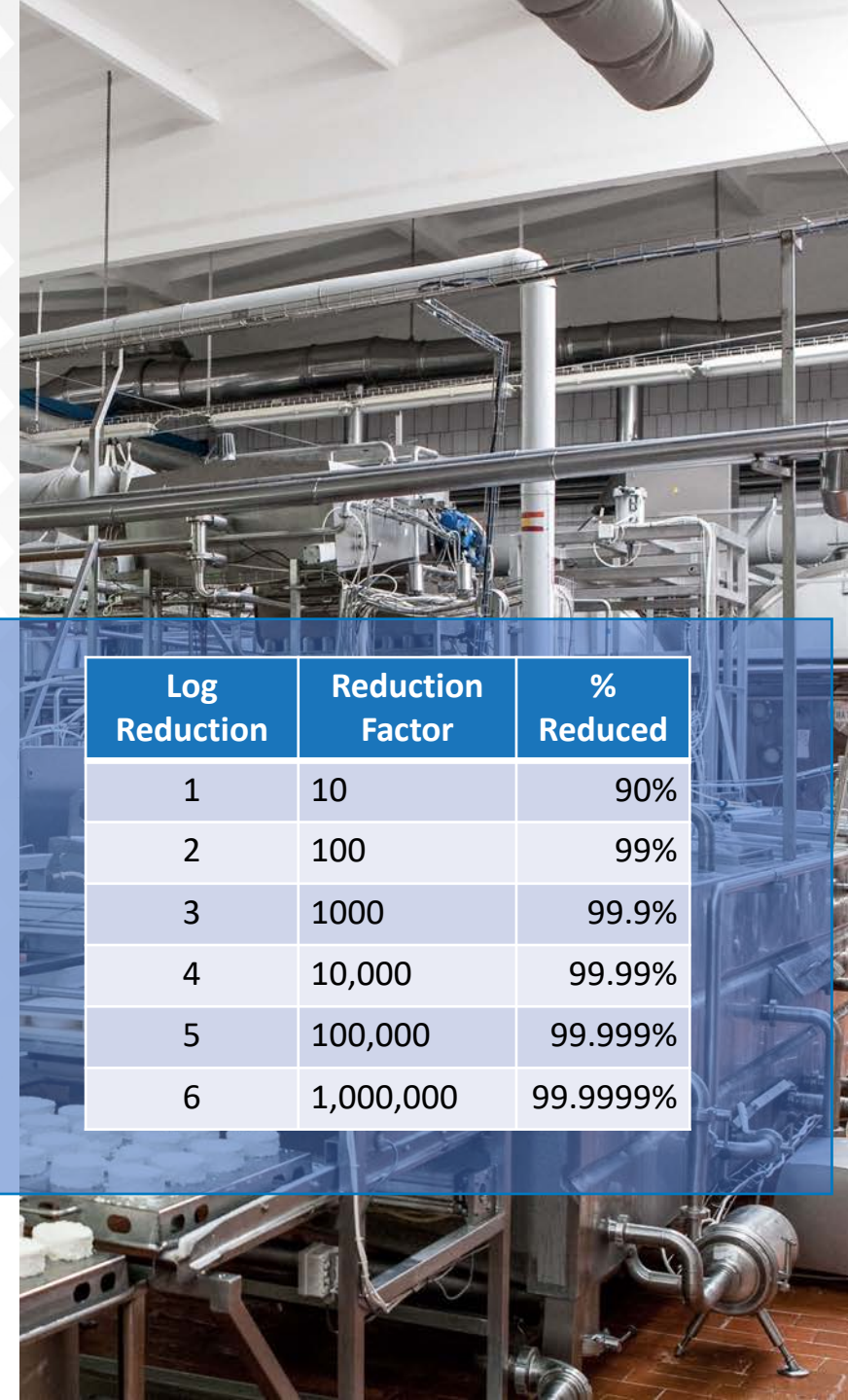
# // IDENTIFY UV DOSE

## STEP 3

- **IDENTIFY** TARGETED MICROORGANISMS
- **PAIR** WITH LOG REDUCTION FOR EFFECTIVENESS

PATHOGENS	Common Name	Scientific Name	3 Log Reduction
Viruses	Rota	Rotaviruses (Human)	32 $\text{mJ}/\text{cm}^2$
	Infectious Hepatitis	Hepatitis B	25 $\text{mJ}/\text{cm}^2$
	Adenovirus		126 $\text{mJ}/\text{cm}^2$
	ECHO Virus	Echovirus	25 $\text{mJ}/\text{cm}^2$
Bacteria	Salmonella	Salmonella Typhimurium	22 $\text{mJ}/\text{cm}^2$
	Staph	Staphylococcus aureus	3.2 $\text{mJ}/\text{cm}^2$ (2 log)
	Strep	Streptococcus faecalis	9.8 $\text{mJ}/\text{cm}^2$

- UV dose determines proportion of a specific microorganism is destroyed after a particular dose of UV radiation
- **Target 50  $\text{mJ}/\text{cm}^2$**  to deactivate the average bacteria/virus



Log Reduction	Reduction Factor	% Reduced
1	10	90%
2	100	99%
3	1000	99.9%
4	10,000	99.99%
5	100,000	99.999%
6	1,000,000	99.9999%



## Summary of studies performed on the Coronaviruses under UVC exposure should adequately show the UVC inactivation of the SARS CoV-2(COVID-19) virus

MICROBE	DOSE (Log 1) mJ/cm <sup>2</sup>
Coronavirus	.007 mJ/cm <sup>2</sup>
Berne virus (Coronaviridae)	.007 mJ/cm <sup>2</sup>
Murine Coronavirus (MHV)	.015 mJ/cm <sup>2</sup>
Canine Coronavirus (CCV)	.029 mJ/cm <sup>2</sup>
Murine Coronavirus (MHV)	.029 mJ/cm <sup>2</sup>
SARS Coronavirus CoV-P9	.040 mJ/cm <sup>2</sup>
Murine Coronavirus (MHV)	.103 mJ/cm <sup>2</sup>
SARS Coronavirus (Hanoi)	.134 mJ/cm <sup>2</sup>
SARS Coronavirus (Urbani)	.241 mJ/cm <sup>2</sup>
AVERAGE	.067 mJ/cm <sup>2</sup>





# // CAN UVC INACTIVATE SARS-CoV-2?

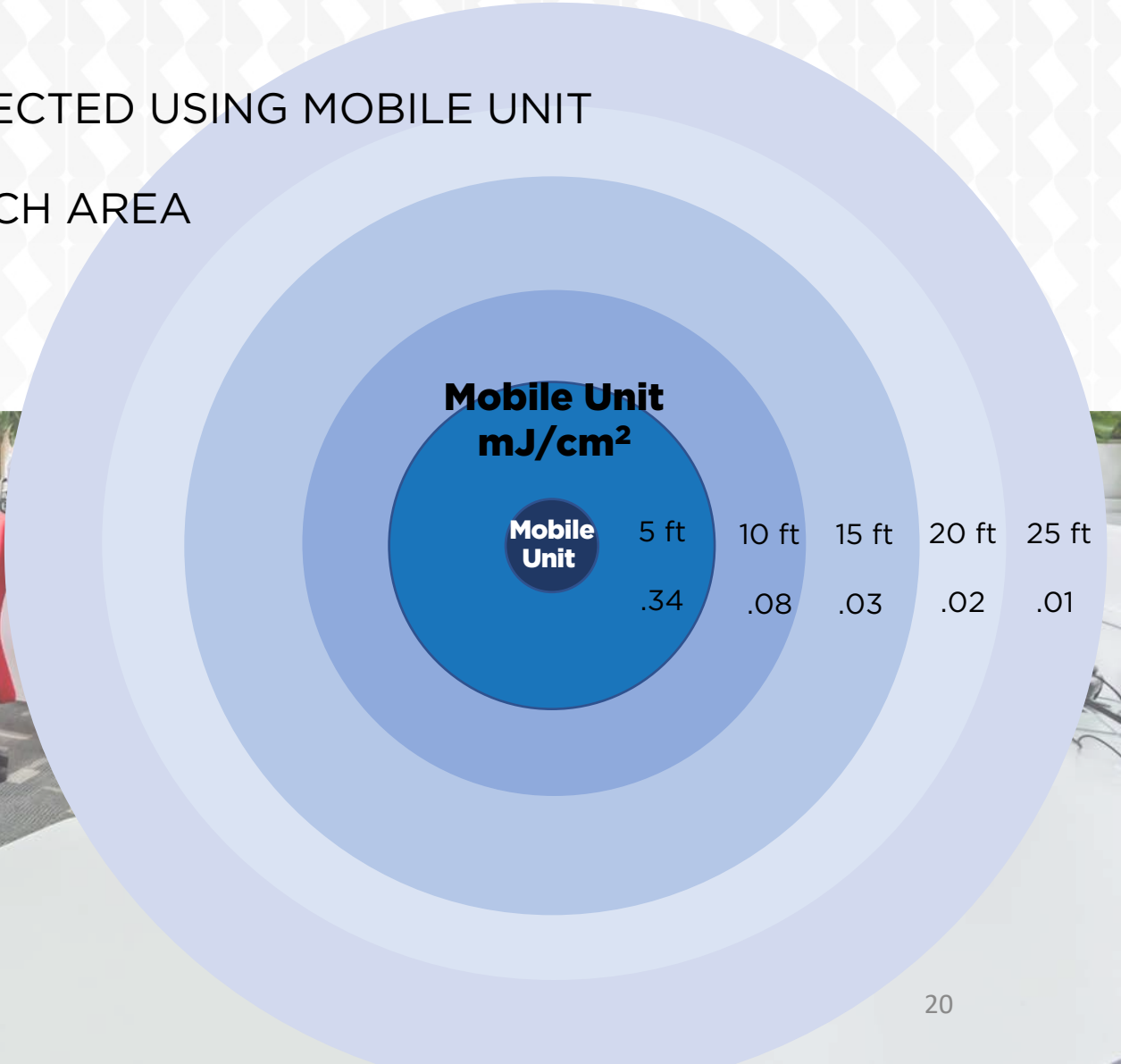
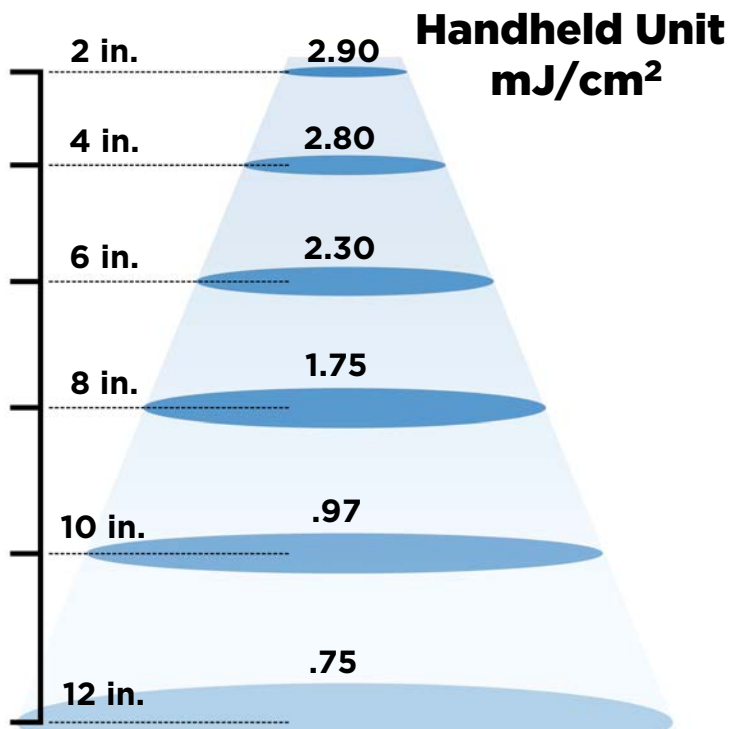
- UVC light has been found to destroy [viruses](#) and [other microbes](#) on surfaces.
- COVID-19 is a small, single stranded RNA virus, making it much easier to inactivate in comparison to double-stranded RNA/DNA pathogens like Reoviridae & Rotavirus.
- [“The inactivation rates of the small RNA viruses, poliovirus 1, and coxsackievirus B4, by low pressure UV were very rapid and reached approximately 4 log and greater than 5 log, respectively, within a UV dose of 30 mJ/cm<sup>2</sup>.” \(US Environmental Protection Agency\)](#)
- The U.S. government and the UV technology [industry](#) are working to [define standards](#) for UV disinfection technologies in healthcare settings.
- Most UV sanitizers have not been tested against the novel coronavirus, SARS-CoV-2, but UVC light has been shown to destroy related coronaviruses, including the one that causes the disease [MERS](#).



# // SURVEY AREA TO BE DISINFECTED

## STEP 4

- **MEASURE** DIMENSIONS OF AREA TO BE DISINFECTED USING MOBILE UNIT
- TARGET **UV DOSE** is 50 mJ/cm<sup>2</sup>
- PLACE 1 **DOSIMETER CARD** AT EACH HIGH TOUCH AREA





# // CALCULATE ESTIMATED EXPOSURE TIME

## STEP 5

- **DETERMINE PLACEMENT** OF MOBILE UNIT AND NUMBER OF UNITS TO DISINFECT AREA
- **CALCULATE EXPOSURE TIME** = UV INTENSITY / UV DOSE / 60 SECONDS
- UV DOSE = 50 mJ/cm<sup>2</sup>

Calculated Exposure time (not actual)

XLM Product	Distance	Exposure Time =	UV Intensity /	UV Dose
Handheld	4 in.	18 sec	2.80 mJ/cm <sup>2</sup>	50 mJ/cm <sup>2</sup>
Mobile	5 ft	6 min	.34 mJ/cm <sup>2</sup>	50 mJ/cm <sup>2</sup>
	10 ft	17 min	.08 mJ/cm <sup>2</sup>	50 mJ/cm <sup>2</sup>
	15 ft	28 min	.03 mJ/cm <sup>2</sup>	50 mJ/cm <sup>2</sup>

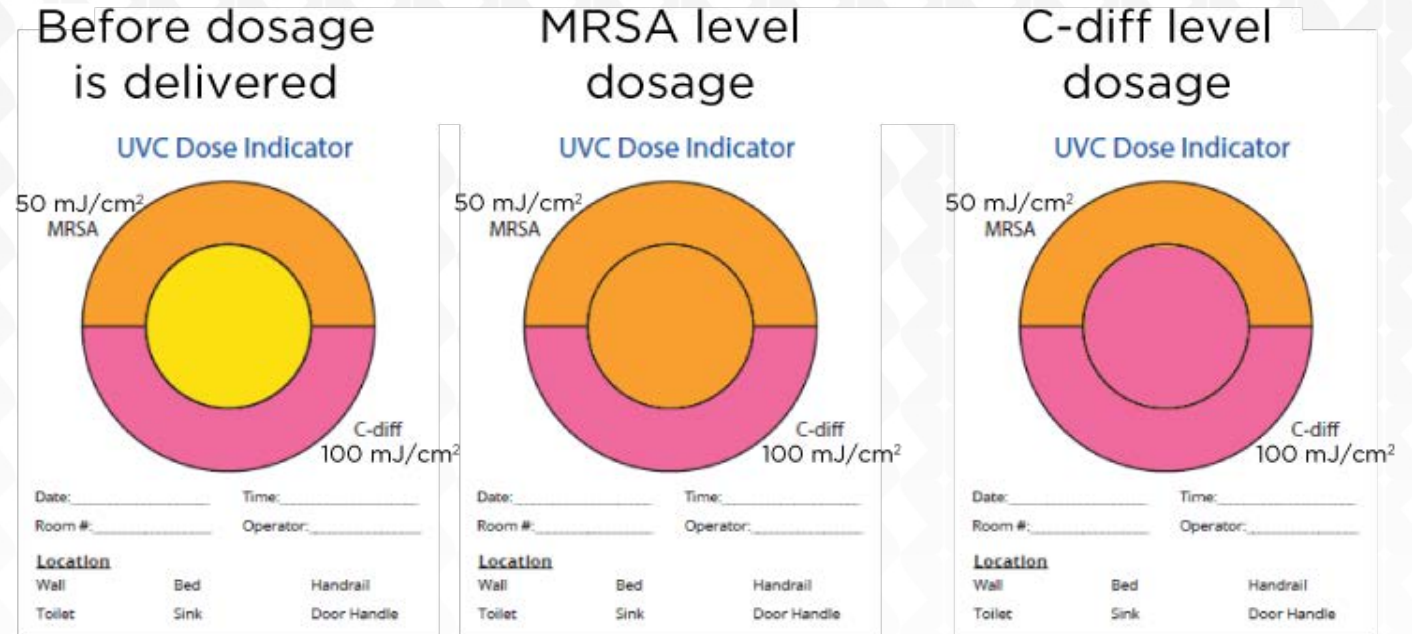




# // DISINFECT AREA AND VALIDATE WITH DOSIMETER CARDS

## STEP 6

- Follow safety guidelines
- Disinfect targeted area
- Verify dosimeter card
  - Color changes from **yellow to orange** validates 50 mJ/cm<sup>2</sup> delivered
  - Color changes from **orange to pink** validates 100 mJ/cm<sup>2</sup> delivered
- Read dosimeter card within 24 hours after disinfection
- Dosimeter cards are single use



**Actual exposure time with Mobile UV-C model**

DISTANCE	EXPOSURE TIME	DOSIMETER CARD
5 ft	3 min	50 mJ/cm <sup>2</sup>
5 ft	5 min	100 mJ/cm <sup>2</sup>
10 ft	5 min	50 mJ/cm <sup>2</sup>
10 ft	10 min	100 mJ/cm <sup>2</sup>



# // SUMMARY

1. Disinfection of air and surface with germicidal light is a well-established technology with demonstrated effectiveness against many pathogens
2. 254 nm UVC is the predominant wavelength today due to its high effectiveness
3. Care must be taken to limit human exposure and exposure of materials subject to photodegradation





# // HOW TO ORDER

1. Contact Customer Service
  - I. (800) 678-6960
  - II. [customerservice@xlm.com](mailto:customerservice@xlm.com)
2. Contact your XtraLight Rep
  - I. Order Form
  - II. Public sector volume pricing - call customer service
3. Delivery 2 to 3 weeks
4. Accepting PO's from Reps and existing customers

Production will be held until payment is received

**\*\*All orders are prepaid and non-cancellable**





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