



Torch UV Disinfection System Data Sheet

ClorDiSys Solution's Torch™ UV Disinfection System is designed to be the most efficient, effective, and affordable UV Decontamination System for rooms available. The Torch is a portable, high efficiency device that is designed for reliable daily use to reduce organisms at your facility with no yearly service contract required. The Torch system itself offers the lowest price per UV-C watt output available. Treatment costs under a dollar and low lamp costs further enhance the affordability.

The Torch contains eight high powered UV-C lamps to provide quick disinfection times. It simply plugs into any wall outlet. Each Torch tower produces an efficient UV-C output of 12 mJ/min (200 $\mu\text{W}/\text{cm}^2$) to get a calculated 99% reduction of MRSA in and *Clostridium difficile* in 1 minute at 10 feet.



Background:

- 1.7 Million Americans contract an HAI every year. 99,000 of these patients die from the complications of an HAI (Srinivasan 2009).
- 33% of Operating Rooms responded as to having an infection or outbreak in the last six months (ICT 2013).
- 41% of patient rooms had at least one surface contaminated with MRSA and/or *C. difficile* (Faires 2013).
- Up to 60% of hospital uniforms are colonized with potentially pathogenic bacteria (Wiener-Well 2011).
- For healthcare workers entering a room containing a patient with MRSA infection, the bacteria would be found on the healthcare worker's clothes approximately 70 percent of the time, even if the healthcare worker did not touch the patient (Pyrek 2012).

Features:

Efficacy

- The Torch utilizes 8 high-output UV-C bulbs to achieve efficient, fast disinfection times. UV-C output was designed to obtain a greater than 99% reduction of typical viruses and bacteria in a 1 minute timeframe and on spores like C-diff in 5 minutes at a distance of 10 feet.
- The center of the Torch is open so that each of the 8 UV-C bulbs can radiate its light 360 degrees.
- The UV-C bulbs are angled to increase the dosage applied to the ceiling. Ceilings do not receive the same level of cleaning that floors get, so angling the bulbs allows the room to get a more complete disinfection.
- Up to 4 Torches can be daisy-changed together to treat larger areas or areas with complex shapes to get optimal coverage. Multiple Torches can be placed into a room in order to get more effective kill (and still be cheaper) than a single competitor unit.
- Optional: A UV intensity sensor is available to monitor both the intensity and dosage.

Affordability

The Torch is designed to be the lowest cost, high-output UV generator available.

- The Torch is priced much lower than similar UV-C Room Disinfection Systems.
- There are no required service or maintenance contracts with the Torch.
- The Torch has an average operational cost of 5¢ per hour of use.
- Premium solid state ballasts and quartz glass bulbs are used, which helps to extend the useable life of the UV-C bulbs to over 16,000 hours and reduce operational costs.



Torch Sensor Module

- In addition to their long lifespan, replacement UV-C bulbs are much less expensive than bulbs from other manufacturers to further reduce operational costs.

Ease of Use

- The Torch draws only 6 amps of power, allowing it to be plugged into any outlet.
- Easily operated with minimal training.
- No special room preparation is required.
- No chemicals to store and handle.
- Clearly labeled remote control for operating Torch
- Data from the sensor module is downloadable enabling it to be exported for archival purposes.
- Optional: UV Sensor to trend and save exposure data, room number, and user information.

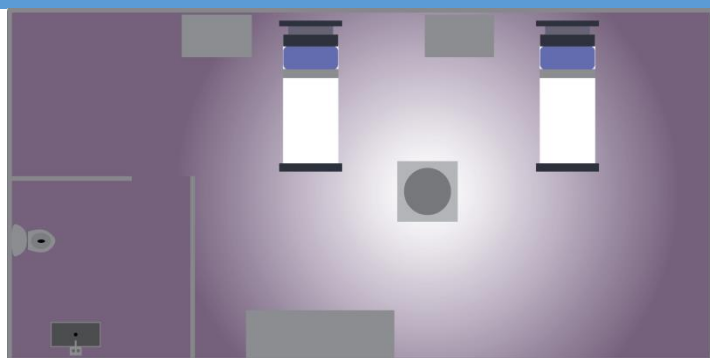
Safety

- Each Torch tower comes with a remote that is used for starting, stopping, and resetting the Torch allowing the user to remain outside the room at all times.
- 4 motion sensors to abort the UV exposure if motion is sensed in room.
- Each Torch tower has an emergency stop button to inhibit a cycle or abort the process if pressed if the process is started while someone is still in the room.
- No disposal of chemicals or clean up required after use.
- No special lamp recycling required.
- The bulbs used in the Torch are Low Ozone emitting bulbs.
- The Torch UV Disinfection System must be manually reset if safety device is tripped. This prevents inadvertent restart of UV exposure as a further safety precaution.
- Bulbs are coated with Teflon for strengthening as well as containing glass shards if accidentally broken.

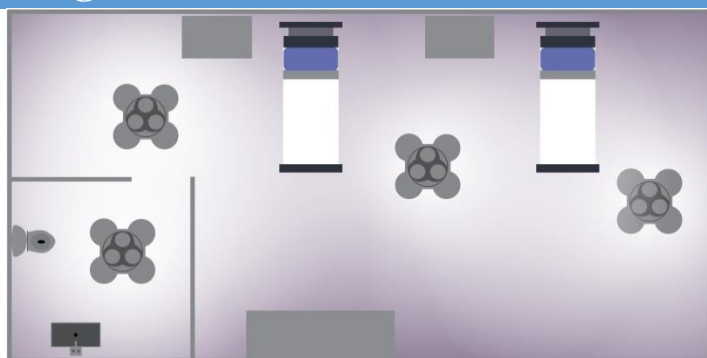


Emergency Stop Button

UV Coverage



One High Priced UV System



Multiple Lower Cost Torches

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|---|---|
| <ul style="list-style-type: none"> • One system can't shed light on all surfaces (many shadow areas) • Multiple exposures are needed to disinfect all surfaces leading to longer overall room treatment times | <ul style="list-style-type: none"> • Multiple systems can be arranged to eliminate or greatly minimize shadow areas such that only one exposure is necessary (no opportunity for cross-contamination) • Shorter room turnover times |
|---|---|

Specifications:

- Torch Tower
68" H x 23" D x 23" W (1727mm H x 584mm D x 584mm W)
110-240 VAC, 6 Amps, 50/60 HZ
71 lbs (32 kg)
- Lamps are rated 16,000 hours.
- Lamp type: 4-pin, low pressure, UVC Germicidal, low ozone
- Lamp quantity: 8
- Power cable: 15 feet, hospital grade
- Produces an intensity of approximately 200 $\mu\text{w}/\text{cm}^2$ at 10 feet distance for a dosage of 12 mJ/minute

Design Features:

Protective Cover – A heavy duty cover is supplied with the Torch Tower to cover it when moving it around or storing it to better protect the lamps from damage.

Lamp Guard – A stainless steel protective lattice is incorporated into the Torch Tower to help protect the lamps from accidental breakage due to bumping hazards or items falling on it when the Protective Cover is not in place.

Data Logging – Alarms and room numbers are logged as well as UV data if the UV Sensor option is chosen.

Remote Operation – An easy to use remote is included with every Torch system to allow the user to start, stop, and reset the Torch from a safe location.

Options:

UV Sensor - An optional UV sensor is available to display and log dosage, room number, and user information.

Bulbs:

ClorDiSys Solutions utilizes quartz lamps in the Torch UV System. Quartz is the premier material for UV producing lamps. ClorDiSys utilizes standard bulb lengths and ballasts. Our bulbs offer the best electrical efficiency by converting up to 40% of electrical power into to UV power. Our bulbs have a warm-up time approx. 30 - 60 sec.. With our LongLife+™ coating process, our low pressure mercury lamps have an operating life of up to 16,000 hours, maintaining an end-of-life UVC output of 80%.

Used Bulb Waste Disposal

Our germicidal lamps are Toxicity Characteristic Leaching Procedure (TCLP) compliant. Lamps that PASS the TCLP test are considered as non-hazardous waste by the EPA.

In 1990 the EPA developed the TCLP test to simulate the effect of disposing waste in conventional landfills under complex environmental conditions. The method is designed to determine the mobility of toxic material in liquid, solid and multiphasic waste. The EPA developed the TCLP to determine the toxicity of waste. The TCLP test does NOT measure the total mercury content but rather the potential of mercury to leach into groundwater if the waste is disposed of in a landfill. TCLP is designed to simulate the leaching that the waste will undergo if disposed of in a sanitary landfill. This test includes mercury, lead, cadmium, and other hazardous materials. Passing this test for mercury, for instance, requires a yield of less than 0.2 milligrams per liter upon completion of the test.

While lamps that pass TCLP may be classified as non-hazardous waste by the EPA, ClorDiSys Solutions and Clean Hospitals strongly encourage the recycling of spent germicidal lamps. Please contact your local environmental agency for assistance with lamp recycling or visit www.lamprecycle.org.

Exposure Time Required for Given log Reduction of Various Organisms		Distance (ft)								
		2	3	4	5	10	15	20	25	
Organism/Reduction	Required dose (mJ/cm ²)	Intensity (mJ/(cm ² *min))								
		102	61.5	48.8	37.8	12.7	4.8	2.58	1.86	
		Exposure Time (min)								
C. diff spores										
3 log	68.6	0.67	1.12	1.41	1.81	5.40	14.29	26.59	36.88	
4 log	135.8	1.33	2.21	2.78	3.59	10.69	28.29	52.63	73.01	
B. subtilis spores										
2 log	39	0.38	0.63	0.8	1.03	3.08	8.13	15.1	21	
3 log	60	0.59	0.98	1.23	1.59	4.74	12.5	23.3	32.3	
S. aureus										
2 log	5.4	0.05	0.09	0.11	0.14	0.43	1.13	2.09	2.9	
3 log	6.5	0.06	0.11	0.13	0.17	0.51	1.35	2.52	3.49	
E. coli										
2 log	6	0.06	0.1	0.12	0.16	0.47	1.25	2.33	3.23	
3 log	9	0.09	0.15	0.18	0.24	0.71	1.88	3.49	4.84	

