

Using UV Light to Protect Staff & Customers



Summary

Smartphones and tablets are an integral part of everyday life. For businesses ranging from hospitality to corporate offices, these devices pose a challenge for staff and customer health. They're frequently touched, but rarely cleaned, undermining hand hygiene and spreading germs. As the world looks to a "new normal" post-Covid-19, organizations must find a way to keep staff and customers safe.

There are numerous UV solutions on market, but they are not all created equal. This guide is designed to help stakeholders critically evaluate claims made by manufacturers and understand the impact different features can have on effective corporate deployments.

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Note: The terminology and standards in this guide are applicable to facilities in the USA and Canada.

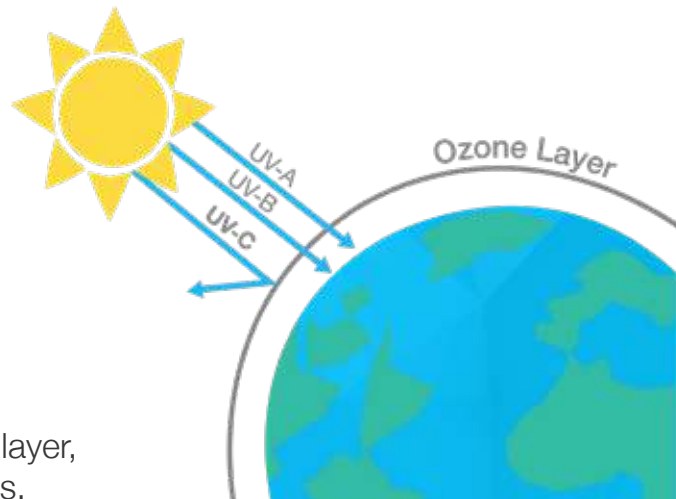
1. The Science of Ultraviolet (UV) Light

What is UV Light?

Germicidal UV has been used in healthcare, food processing, and biotech for over 30 years. UV light is categorized according to wavelength:

- UV-A: 400-320nm (nanometers)
- UV-B: 320-280nm
- UV-C: 280-100nm

UV-C light, which is normally blocked by the ozone layer, can be used to deactivate bacteria, viruses & spores.



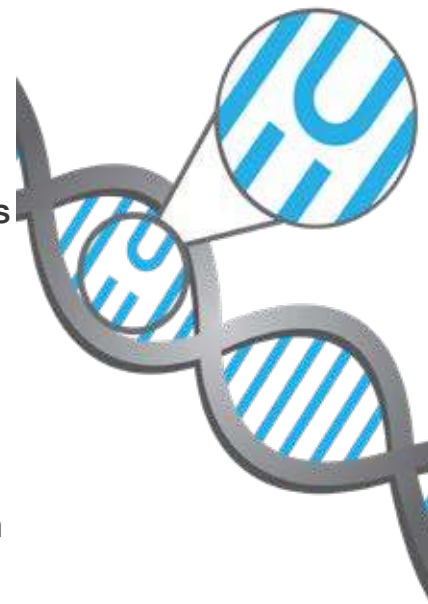
How Does UV-C Kill Pathogens?

UV-C light disrupts the DNA of pathogens, destroying their ability to function and to replicate. It does not physically remove the cells. This technology works by line of sight, so the light must reach a surface in order for bacteria or spores to be de-activated.

[See this article](#) for a full explanation on germicidal UV.

Useful Facts about UV Light for Mobile Devices

- UV light won't harm touchscreens, cameras, or IR sensors. It can accelerate natural aging of white plastics (similar to being left out in the sun). **You should confirm with each manufacturer that they've conducted accelerated materials testing on their product and request the test reports.**
- UV is optimal for hard, non-porous surfaces. It is unlikely to be 100% effective on fabrics.
- Bioburden (ie. skin cells, fingerprint oils and other substances) can shield pathogens from UV light. It's important to ensure that efficacy testing includes bioburden. Otherwise, disinfection may only be achieved if devices are wiped down prior to every use cycle which can negate some benefits of using UV light.
- In the event that a device is heavily soiled (aka blood spatter or accumulated proteins) facilities should provide a way for staff to wipe down the device prior to UV disinfection that doesn't rely on harsh chemicals (ex. a damp microfiber cloth).



2. Categories of Desktop & Countertop UV Solutions

Countertop UV disinfection solutions can be placed into three broad categories:

▶ **Rapid Disinfection.** These solutions are designed to integrate into the daily workflow of public and corporate environments. Specifications typically include:

- 20-75 second cycle time
- 1-4 phones or tablets sanitized at once
- No device charging due to fast cycle time

Solutions include but are not limited to: CleanSlate UV, ReadyDock® DUO, PhoneSoap®, AUVS, and Sky 7xi®. Claims between systems vary.

▶ **Terminal Disinfection.** With a cycle time of 5-15 minutes, these solutions are designed to sanitize while devices are charging. They typically add value via device management features and can be paired with rapid disinfection solutions. Most solutions have a 5-10 device capacity.

Solutions include but are not limited to: SealShield ElectroClave® and ReadyDock® RD5.

▶ **Consumer Sanitizers.** These systems are typically sold direct to consumer. They have a cycle time of 5-15 mins, charge devices while sanitizing, and kill ~99.9% of household bacteria. They are inexpensive but often lack the efficacy of hospital-grade UV sanitizers.

Solutions include but are not limited to: PhoneSoap® 3.0, PhoneSoap® XL, and LeadYoung UV.

2.1 Should You Use Rapid or Terminal Disinfection? Or Both?

This decision typically comes down to workflow and desired impact. As outlined above, rapid disinfection solutions are designed to quickly sanitize staff and visitor devices as they walk throughout a facility or office. They allow frequent and consistent disinfection, addressing infection control concerns throughout a shift.

If you plan on frequently returning devices to charging bays and want to leverage that downtime for secondary disinfection, a terminal disinfection solution may be effective.

Facilities will sometimes deploy a rapid disinfection solution across multiple departments while also leveraging terminal disinfection for specific 'frequent charge' deployments.

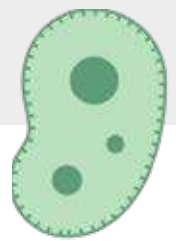


3. Key Questions When Evaluating a Solution

Several countertop UV solutions have come to market in the past three years - many making similar claims with regard to efficacy, workflow and overall infection control.

To choose the optimal UV system for your facility, ask yourself these questions:

- A. *What Are the Assumptions Within the Efficacy Claims?*
- B. *Are There Proper “Instructions For Use” On the Device?*
- C. *What Kind of Safety Certifications Does the Product Have?*
- D. *Is the Product Easy to Use? Is it Visitor Friendly?*
- E. *Do You Want to Log & Track Compliance?*
- F. *Does The Product Support Broader Infection Control Goals?*
- G. *What Are The Maintenance Requirements?*



A. What Are The Assumptions Within The Efficacy Claims?

Efficacy claims are the most important factor to critically examine. Several UV sanitizers on the market, especially those being sold at lower price-points, have assumptions built into their efficacy testing regimes that can skew results.

The first thing you should do is request a copy of 3rd party lab testing. The testing protocols should be based off of ASTM E1153, the same standard used by chemical disinfectant wipes. This is an EPA recognized standard for efficacy claims on non-food contact surfaces.

When you examine the efficacy data itself, be on the lookout for:

- **Testing times different than the default cycle time** (ie. Testing conducted with 60 second UV exposure but the product’s default cycle is 30 seconds).
- **No simulated soiling.** Several UV solutions test without 5% soil present, which means they are assuming that the devices will be wiped down prior to UV disinfection.
- **UV coverage.** If the solution uses a metal mesh basket, this will affect efficacy. Light cannot deactivate bacteria that it cannot reach.
- **Pathogens tested.** Some pathogens (ie. *C. Difficile spores*) are more difficult to deactivate with UV light. Ensure manufacturers have run individual tests against all claimed superbugs.
- **New vs. old bulbs.** UV lamp output drops 40-50% over time. If a product has used new bulbs in their efficacy testing, it will not prove effectiveness throughout the life of the product.

THE BOTTOM LINE: Manufacturers can manipulate several variables to make a product seem more effective than it is. Ensure the product’s claims align with the default use case and check that log-kill claims are externally proven using EPA recognized standards.

B. Are There Proper “Instructions For Use” On the Device?

UV light is effective through line of sight. If users are not clearly instructed on device placement, devices may touch or overlap, undermining the solution’s effectiveness. Additionally, UV light is not suitable for some. This should be made 100% clear via signage on the device.

User instructions should be clearly visible in order to ensure the safe and effective use of the product, especially if visitors will be allowed or encouraged to use the product.

C. What Kind of Safety Certifications Does the Product Have?

Hospital environments demand rigorous product certifications. It’s important that any solution leveraging novel technology adheres to established UL/IEC product safety standards.

If you’re deploying countertop UV in a hospital there are three standards you should be aware of:

- **Electrical safety UL 61010-1.** This is a safety standard recommended for any type of critical equipment. It ensures the product is safe and can withstand the rigors of daily public use.
- **UV safety IEC 62471.** This is especially important for countertop UV solutions. It ensures that the UV light is contained and that users are protected from accidental exposure.
- **EMC/EMI Safety.** The standard for lab equipment is IEC 61326 or FCC Part 15 Subpart B. This will ensure the product doesn’t generate magnetic noise that could impact other devices.

Ensure that the certifications were conducted by an accredited test lab (UL, TUV, CSA, etc) and always ask for a copy of the certifications for review by your staff.

D. Is the Product Easy to Use? Is it Visitor Friendly?

One of the primary challenges with chemical wipes is that people simply don’t want to use them on expensive devices. Facilities are turning to countertop UV to encourage more frequent disinfection without using harmful chemicals.

To be effective, solutions **MUST** be intuitive and user friendly. They should require no training and should clearly instruct people how and where to place their devices. Ensure the signage on the product provides clear and simple instructions.



E. Do You Want to Monitor Usage and Performance?

One of the disadvantages of manual wipes is not being able to log usage. Several UV solutions can be equipped with IoT technology that allows for usage data to be analyzed in real time. This can allow for easy workflow optimization and fleet-wide UV device management.

When evaluating an IoT-enabled solution you will want to ask:

- Does the solution have a secure, cloud-based platform?
- Can devices be managed from a web or mobile app?
- Does the solution monitor and report UV bulb status and allow for preventative maintenance planning and downtime analysis?
- Does the solution include a web dashboard and/or email reporting function?

F. Does The Product Support Broader Infection Control Goals?

Reducing bacterial loads on mobile devices is often a standalone goal. But UV solutions can also support broader infection control initiatives.

First, you want to ensure the solution is fast enough to use while washing or sanitizing hands. Speed is a driving factor in compliance, especially if you want people to sanitize devices at they enter or exit a store. *This is why it is important to verify that default cycle times align with efficacy data.*

Second, **you'll want to ensure that you can retrieve devices without re-contaminating your hands.** If a user has to grab a handle or open a slot to retrieve their device, this can spread bacteria to clean hands and undermine the entire process.



G. What Are The Maintenance Requirements?

UV bulbs degrade over time and will need to be replaced. You will want to ensure that bulbs can be quickly replaced. Look for solutions that allow hospital staff to replace bulbs with minimal training or labour. Some solutions require costly external technicians or depot maintenance, which is something you should ask manufacturers about.

Conclusion

Mobile device hygiene is a growing challenge. Countertop UV disinfection can be a fast and effective solution to this challenge - but not all solutions are created equal.

We hope this guide was helpful in explaining some of the questions and criteria that your facility should consider when evaluating a UV solution for tablets, phones & other portable items.

Our team at CleanSlate UV has been working since 2014 to provide *intuitive, quick and effective* solutions that are proven to eliminate pathogens on mobile devices.

In the course of our product development and efficacy research we have consistently utilized the most rigorous testing standards and assumed worst-case user scenarios. This has resulted in a product that is now trusted in the healthcare, food processing, and biotech production facilities.

If you're interested in learning about how we can assist your facility in de-risking the use of mobile devices, [please get in touch.](#)



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Corporate Evaluation Checklist for Rapid Disinfection

Efficacy	Y/N
Has the UV solution been tested according to ASTM E1153 or another EPA-endorsed standard for non-food contact surfaces? (<i>Note: ASTM E3135 has not been endorsed by the EPA</i>)	
Does the testing regime include simulated bioload/soiling (ie. 5% FBS)?	
If not , does the solution clearly advertise that devices need to be wiped down prior to each cycle?	
Does the cycle time in the efficacy report match the product's default cycle time?	
Does the solution provide 360° UV exposure without interference from parts of the tray (ie. metal mesh)?	
Has the manufacturer tested their solution against each claimed pathogen in individual tests?	
Does the solution actively monitor bulb status to ensure sufficient UV exposure?	
Has the manufacturer conducted efficacy testing using bulbs at the end of their rated lifespan to account for output degradation over time?	
Instructions for Use	Y/N
Does the solution instruct users how to place devices within the chamber so that devices are properly sanitized every time ? (ie. Users must leave spaces between devices, must have screens visible, etc)	
Does the solution clearly state what types of devices are not suitable for UV-C disinfection?	
Certifications	Y/N
Has the manufacturer provided material testing reports to ensure that UV dosage won't damage devices?	
Has the solution been certified to electrical equipment safety standard UL 61010-1 or UL 60601-1?	
Has the solution been certified to IEC 62471 for UV safety?	
Has the solution been certified to IEC 61326 or FCC Part 15 Subpart B to ensure the EMC/EMI from the solution won't interfere with sensitive hospital equipment?	
If no to any of the above , are there other globally recognized standards the solution is certified to for use in a lab/medical environment?	
Has the certification been completed by an accredited testing laboratory?	
Maintenance	Y/N
Can bulb replacements be performed onsite in under 10 minutes?	
Can bulb replacements be conducted by staff with minimal or no training? (if desired)	
Usage	Y/N
Do you intend to have the solution regularly operated by untrained users?	
If yes , is the solution intuitive enough to use without training? Does it have clear, simple user instructions?	
Is the solution's tray wide/tall enough to sanitize multiple devices at once while ensuring they don't overlap?	
Can the solution accomodate items at least 3" in height? (ie. barcode scanners, etc)	
Enterprise Device Management	Y/N
Is monitoring the usage and maintenance status of UV sanitizers important to you?	
If yes , does the device contain intelligent monitoring and reporting functionality?	
Does the solution include an online dashboard or email reporting that can easily present analytics?	
Broader Infection Control	Y/N
Is the solution fast enough to align with washing or sanitizing your hands?	
Does the solution allow for touch-free retrieval of devices after disinfection to eliminate cross-contamination?	
Does the solution encourage users to wash or sanitize their hands while devices are being sanitized?	

This is provided as a template for infection control managers, nurses, purchasers and biomedical engineering. The criteria on this checklist are not exhaustive and may vary from facility to facility. To receive a .docx version please contact CleanSlate UV.