

# COMPREHENSIVE UVC DISINFECTION

Finsen Tech offers products specifically tailored for disinfection of both whole rooms and individual objects using ultraviolet radiation

By Annette Crowe

**F**insen Tech is an international Environmental Protection Agency (EPA)-registered manufacturer and provider of UVC products and services, contributing to the prevention and reduction of healthcare-associated infections (HAIs) by delivering scientifically proven, cost effective rapid high disinfection technologies. Finsen Tech produces the world leading Telescopic High Output Rapid UVC robot, THOR UVC®.

Our company philosophy states that we will design, develop, and manufacture safe products which excel in terminal disinfection performance reliability and which are manufactured to the highest international quality standards. We will present these at an affordable price, to assist in the seamless implementation for our customers. This commitment extends to everything that we do, to bring our best to the people who use them. Finsen Tech has collective experience and expertise in the medical device and UV infection control and hospital sterilisation space spanning more than four decades and was formed following extensive years of research and development into the most cost effective delivery systems of UVC disinfection application.



THOR UVC emergency stop button

## Is UVC disinfection safe?

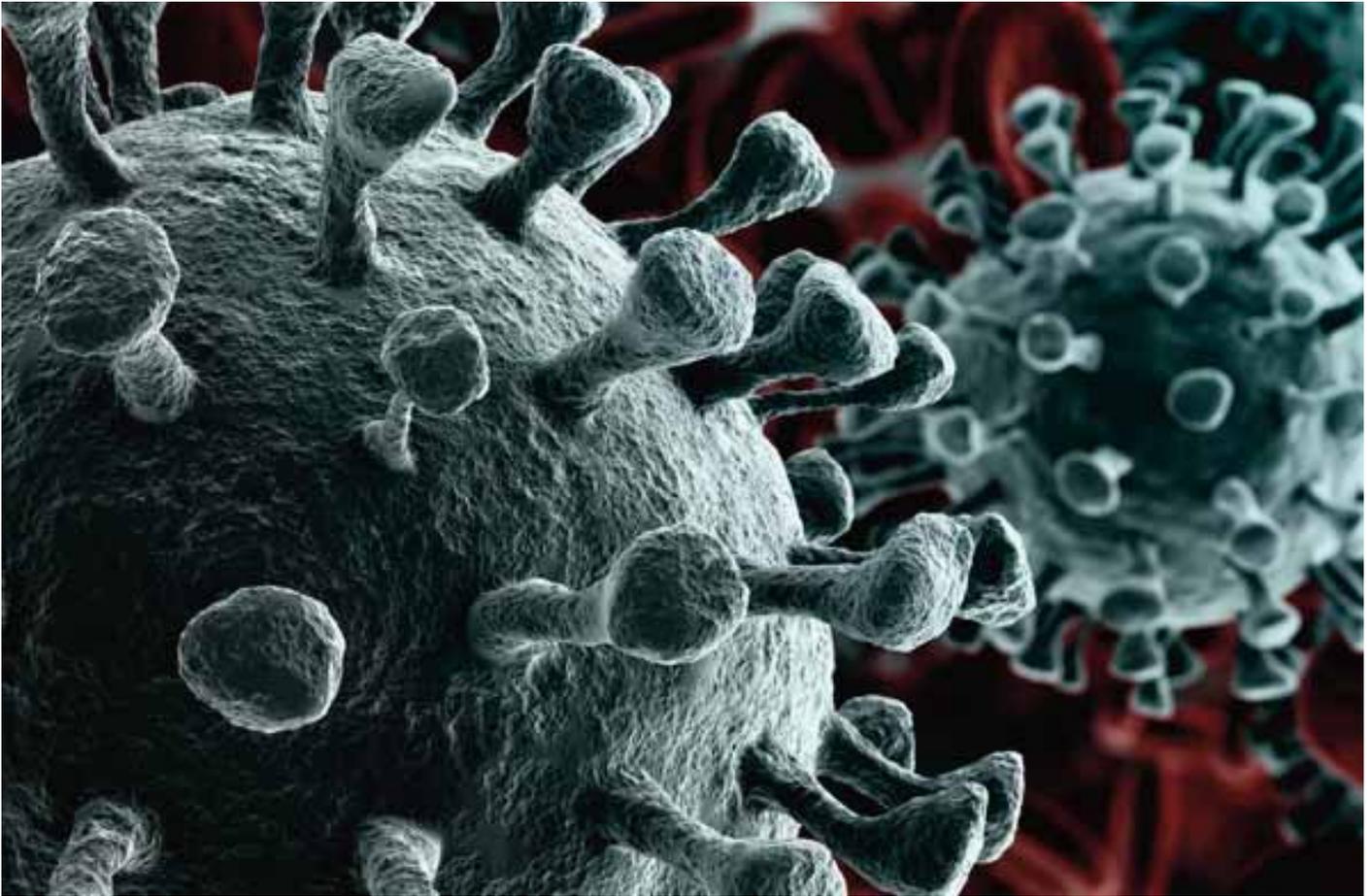
Many businesses and healthcare facilities are finding traditional, chemical cleaning of surfaces insufficient for disinfecting against COVID-19 and are turning to UVC disinfection as an alternative, leading some to ask how safe UVC disinfection really is. The answer is 'very' – provided that the correct precautions are taken and that staff are trained in operating the UVC disinfection equipment.

UVC disinfection is safe when delivered through an automated process where there are no people present (it does otherwise have the potential to be harmful to eye and skin cells). This process, depending on the equipment used, should last only minutes. Once it is complete, the equipment and the room it has disinfected pose no risk of harm.

Different UVC disinfection equipment deals with the requirement that no one be present in the room differently – but our own THOR UVC device has been designed from first principles to put user safety first.

## THOR UVC® safety features include:

- An included tablet, enabling easy wireless remote control of the disinfection and scanning programmes without touching the device itself. This means the user can be safely outside the room when operating the device or adjusting its settings;
- Four heat and motion sensors which shut off all UVC emitters rapidly and automatically if any movement is detected in the room being disinfected. This guards against the possibility that anyone might enter the room while the UVC disinfection is taking place; and
- Two emergency stop buttons mounted at waist height for ease of access and also to ensure that they do not become obstructed by furniture. If for any reason the disinfection must be stopped manually, these buttons are clearly marked and easily usable, even by someone unfamiliar with the device.



While manual, chemical-based surface cleaning does remove coronavirus particles, it is not fully comprehensive and can eradicate as little as 50% of viruses and pathogens.

The design of THOR UVC provides ease of use without compromising safety. While training on the device for users is required, it does not require a technical or specialist background; and the device is designed to help users to ensure its use is as safe as possible at all times.

### **Why cleaning surfaces is not enough to kill COVID-19**

As the pandemic continues to rise across the globe, hospitals and businesses which maintain physical facilities are facing an unprecedented question: how can they ensure that they disinfect against COVID-19 effectively?

To protect the health of patients and staff by combating the spread of the COVID-19 virus, regular and thorough disinfection is crucial. Most healthcare facilities are disinfecting against COVID-19 through deep cleaning surfaces by hand, but is traditional manual cleaning sufficient to disinfect against COVID-19?

The virus can be spread in small particles of liquid emitted from the mouth or nose of an infected person when they cough, sneeze, talk or breathe heavily. These liquid particles range from

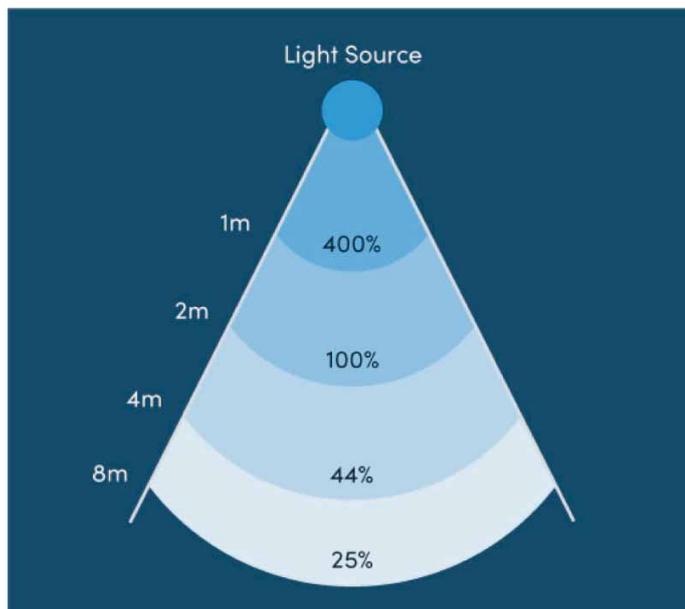
respiratory droplets to smaller aerosols.

Aerosolised coronavirus can remain in the air for up to three hours, as shown in research by Harvard University. Traditional cleaning can only deal with the visible surfaces that people can reach. While traditional, chemical-based cleaning measures carried out by hand continue to be useful, they are no longer sufficient on their own.

### **Many hospitals are now looking to UVC disinfection, which is far more comprehensive**

UVC disinfection – the process of killing germs by using ultraviolet energy – cleans both surfaces and the air around them. It is usually deployed in a room directly following manual cleaning to ensure that the room is comprehensively disinfected. With the right device, it can take less than 15 minutes and can easily be integrated into existing cleaning schedules.

Our own THOR UVC device is ideal for this purpose. It is suitable for even the smallest of rooms and can disinfect a 360-degree area, irrespective of obstacles, killing viruses and bacteria.



The inverse square law employed by THOR UVC

### How UVC disinfection can reduce the risk of HAIs in your healthcare facility

Healthcare-associated infections affect an estimated 300,000 patients per year in England alone and cost the NHS an average of £1bn each year.

Preventing patient infection from this ever-growing variety of mutating pathogens has always been a key priority for healthcare providers.

But while traditional, manual, chemical-based cleaning measures continue to be useful, in isolation they are no longer sufficiently comprehensive in a healthcare setting, due to both the high degree of resilience to antibiotics now present in common HAI bacteria and the arrival of COVID-19 as a further potential HAI.

Traditional surface cleaning techniques eradicate just 50% of viruses and pathogens. However, many healthcare providers are now looking at UVC disinfection, which can offer a far more comprehensive solution – and consequently significantly reduce the risk of HAI for patients.

### What is UVC disinfection?

UVC light is a specific band of UV light, with wavelengths of between 200 and 300 nanometres. When bacteria, viruses or protozoa are exposed directly to UV light of this wavelength, it is absorbed into their cellular RNA and DNA, damaging nucleic acids and creating new bonds between nucleotides in molecules such as thymine.

These new, double bonds (known as ‘dimers’) damage the microorganisms to the extent that they are unable to infect or reproduce, effectively inactivating them.

### Which HAIs does UVC disinfect against?

UVC has been proven to kill common HAIs such as the methicillin-resistant *Staphylococcus aureus* (MRSA), methicillin-sensitive *Candida Auris*, *Staphylococcus aureus* (MSSA), *Clostridium difficile* (C. diff) and *Escherichia coli* (E. coli) and multiple coronaviruses, including COVID-19. In fact, UVC is effective against an extremely wide variety of bacteria, viruses, fungi, and spores and its flexibility means that it is likely to continue to be highly effective as these and other bugs continue to evolve.

With the correct equipment, UVC disinfection is also highly effective at killing COVID-19. A recent study by Boston University (in conjunction with Finsen Tech’s UVC emitter supplier Signify, part of Philips Group) found that COVID-19 was eradicated by the Finsen Tech THOR UVC emitter product within minutes.

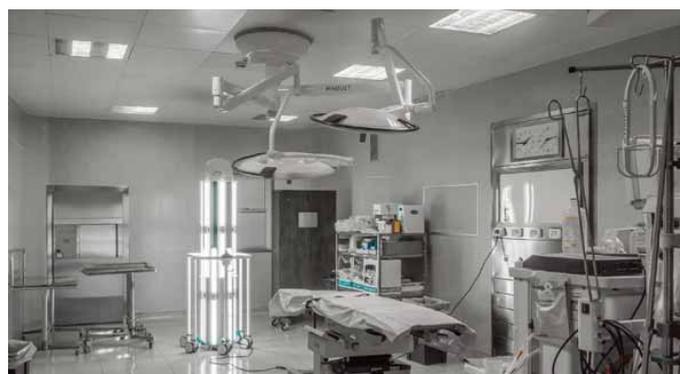
### Can UVC disinfection be used in conjunction with manual cleaning?

Yes: UVC disinfection is a rapid process, taking a few minutes, and therefore can be integrated into existing facility cleaning schedules. It is usually deployed in a room directly following manual cleaning, to ensure that the room is comprehensively disinfected. It is also important to note that manual cleaning is only relevant to surfaces, UVC eradicates pathogens from both the air and surfaces simultaneously.

### Where can UVC light be used?

UVC light can be employed virtually anywhere that the equipment for deploying it can be placed, including:

- Ambulances;
- Patient transport;
- MRI;
- X-ray;
- Physiotherapy;



- Theatre staff rooms;
- Theatre changing rooms; and
- Ward administration desks.

THOR UVC's compact design features castors and a handrail to help staff easily move it into and out of each of these settings, quickly and on a regular basis.

Once in place, it is operated via a custom wireless tablet which is supplied with the product and does not require specialised staff or consultants to operate. Instead, staff will be trained on its use; and a unique, automatic, three-pass room scanning technology will enable them to easily place the THOR UVC in the optimum position for disinfection.

This room mapping – and the subsequent positioning recommendation – is based on the inverse square law, to ensure microorganisms are eradicated as quickly and comprehensively as possible.

### Does UVC disinfection use chemicals or gases?

No chemicals or gases are employed in UVC disinfection. Only UV light is used, making its use a rapid process with no follow-up cleaning required.

### Room-scale disinfection

UVC disinfection can be employed either across an entire room or used to disinfect specific objects; Finsen Tech offers products specifically tailored to each of these purposes. For room-scale disinfection, our THOR UVC robot employs 24 UVC emitters, providing floor-to-ceiling UVC light which will terminally clean both air and surfaces in a room. It will eradicate 99.9999% of HAIs present in the room and is designed specifically to be both comprehensively effective and easy for staff to use. Daily use of the THOR UVC has been proven to reduce the acquisition of HAIs by 37%.

### Disinfection of non-invasive medical equipment and electronic devices

For disinfection of non-invasive equipment and devices, HYPERION® is designed to eradicate pathogens in 60 seconds. 360 degrees of UVC light means it reaches otherwise inaccessible or difficult-to-reach areas of these objects. Sensitive medical equipment which could not withstand cleaning in an autoclave or exposure to chemicals or gases can be fully disinfected within the HYPERION without risking damage to the equipment. HYPERION can be placed almost anywhere that it fits within your facility – it operates at standard



room temperature and pressure, and no special setting is required for it.

### How long does UVC disinfection take?

UVC disinfection is very rapid – THOR UVC takes only minutes to disinfect a room or vehicle, and HYPERION takes only 60 seconds to terminally disinfect equipment.

This makes it ideal for busy healthcare environments, such as ICU, operating theatres and wards in hospitals, where the volume of patients is extremely high and there is very little time to conduct manual cleaning of surfaces between patients.

It can also support increased speed of bed flow, enhancing the patient experience while helping to ensure that they are kept as safe as possible from HAIs.

### How can I find out whether UVC is right for my healthcare facility?

Finsen Tech's team is comprised of researchers, developers, and manufacturers of dedicated UVC devices for the healthcare setting. Our expert team, who built and designed THOR UVC and HYPERION, can advise you on whether these solutions are right for your setting; and, if they are, how best to deploy them quickly and effectively.