



Guidance on the Disinfection of Vicon Passive Retro-reflective Skin Markers and Suits During the Covid-19 Pandemic

3rd September 2020

Preamble

The current outbreak of caused by the novel coronavirus SARS-CoV-2, commonly known as COVID-19, requires enhanced infection control in general motion capture and clinical gait analysis environments. A risk may be from inter-person transmission via items where there is mutual contact possibly during palpation and application of passive retro-reflective skin markers. Social distancing and use of face masks is outside the scope of this guidance.

The impact of the pandemic is continuously evolving and there can be a paucity of peer-reviewed information to draw upon to provide definitive advice. This guidance is based on current international advice and remains subject to change.

General Infection Control Guidance

Facilities undertaking motion capture and gait analysis should undertake best-practice general infection control based on national guidelines. Staff and subjects entering a facility should:

- Follow published facility guidance.
- Not enter the facility if they feel unwell.
- If they subsequently test positive for Covid-19, contact the facility.
- Wash their hands to national guidelines.
- Apply sterilisation gel to their hands.
- Avoid touching their face, in particular eyes, mouth and nose.
- If mandated, staff to wear latex free gloves when palpating and applying skin markers.
- Motion capture suits must be laundered after each use.
- Immediately isolate markers or suits if staff suspect a person has sneezed or coughed over them or observed potential for cross-contamination when handled.

These actions should help to reduce general cross infection via skin markers and motion capture suits. The US Centers for Disease Control and Prevention (CDC) recommends hand hygiene before and after contact with every patient or subject. They estimated one-third of hospital-acquired infections are caused by lack of adherence to established infection control practices such as hand hygiene [1] Although hand hygiene and skin marker and motion capture suit use by an individual are not mutually exclusive, it may be a contributor in disease transmission cascade so should be included when taking evidence-based appropriate actions [2].



Marker Disinfection Guidance

Use of Chemicals to Disinfect Skin Markers

Current advice is to use a virucide (e.g. 70% isopropyl alcohol or Clorox® Disinfecting Wipes) for cleaning markers routinely, in the following steps:

- Wear disposable gloves.
- All double-sided tape attached to the marker must be removed before any further disinfectant activities are undertaken.
- Lightly dampen a corner of a disposable cloth with a small amount of virucide or use the wipes and gently apply to the markers.
- Do not use liquid directly on the markers.
- Do not use the compressor and do not use or spray bleach or any cleaning solutions directly on markers.
- Do not use bleach.
- Do not mix chemicals.
- Check that the performance of the markers are not being degraded by the disinfection activities. Please contact support@vicon.com if the chemicals used impact on performance.

Centers for Disease Control and Prevention provides further disinfection advice [3]. The US Environmental Protection Agency provides a list [4] of approved disinfectants for use against SARS-CoV-2 (COVID-19).

Use of ultraviolet-C (UVC) lamps

The US Food and Drug Administration (FDA) has published guidance on the use of UVC lamps [5], extracted as at 2nd September 2020.

Q: Can UVC lamps inactivate the SARS-CoV-2 coronavirus?

A: UVC radiation is a known disinfectant for air, water, and nonporous surfaces. UVC radiation has effectively been used for decades to reduce the spread of bacteria, such as tuberculosis. For this reason, UVC lamps are often called "germicidal" lamps.

UVC radiation has been shown to destroy the outer protein coating of the SARS-Coronavirus, which is a different virus from the current SARS-CoV-2 virus. The destruction ultimately leads to inactivation of the virus [6]. UVC radiation may also be effective in inactivating the SARS-CoV-2 virus, which is the virus that causes the Coronavirus Disease 2019 (COVID-19). However, currently there is



limited published data about the wavelength, dose, and duration of UVC radiation required to inactivate the SARS-CoV-2 virus.

Q: Is it safe to use a UVC lamp for disinfection?

A: Consider both the risks of UVC lamps to people and objects and the risk of incomplete inactivation of virus.

Risks: UVC lamps used for disinfection purposes may pose potential health and safety risks depending on the UVC wavelength, dose, and duration of radiation exposure. The risk may increase if the unit is not installed properly or used by untrained individuals.

- Direct exposure of skin and eyes to UVC radiation from some UVC lamps may cause painful eye injury and burn-like skin reactions. Never look directly at a UVC lamp source, even briefly. If you have experienced an injury associated with using a UVC lamp, we encourage you to [report it to the FDA](#).
- Some UVC lamps generate ozone. Ozone inhalation can be irritating to the airway.
- UVC can degrade certain materials, such as plastic, polymers, and dyed textile.
- Some UVC lamps contain mercury. Because mercury is toxic even in small amounts, extreme caution is needed in cleaning a lamp that has broken and in disposing of the lamp.

Effectiveness: The effectiveness of UVC lamps in inactivating the SARS-CoV-2 virus is unknown because there is limited published data about the wavelength, dose, and duration of UVC radiation required to inactivate the SARS-CoV-2 virus. It is important to recognize that, generally, UVC cannot inactivate a virus if it is not directly exposed to UVC. In other words, the virus will not be inactivated if it is covered by dust, embedded in porous surface or on the underside of a surface.

To learn more about a specific UVC lamp, you may want to:

- Ask the manufacturer about the product's health and safety risks and about the availability of instructions for use/training information.
- Ask whether the product generates ozone.
- Ask what kind of material is compatible with UVC disinfection.
- Ask whether the lamp contains mercury. This information may be helpful if the lamp is damaged and you need to know how to clean up and/or dispose of the lamp.

Q: Where can I read more about UV radiation and disinfection?

A: For general information about UV radiation, see [Ultraviolet \(UV\) Radiation](#).

For more technical details, see these reports and publications:

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- [Ultraviolet Air Disinfection External Link Disclaimer](#) (International Commission on Illumination: CIE 155:2003)
- [Germicidal Ultraviolet \(GUV\) – Frequently Asked Questions External Link Disclaimer](#) (Illuminating Engineering Society Committee Report: IES CR-2-20-V1)
- [Germicidal Efficacy and Mammalian Skin Safety of 222-nm UV Light](#) (Radiation Research: 187(4); 483–491)
- [UVC Lamps and SARS-COV-2 External Link Disclaimer](#) (International Commission on Non-Ionizing Radiation Protection: ICNIRP)
- [The effect of 222-nm UVC phototesting on healthy volunteer skin: a pilot study External Link Disclaimer](#) (Photodermatology Photoimmunology Photomedicine: 31; 159–166)
- [Far-UVC light \(222 nm\) efficiently and safely inactivates airborne human coronaviruses External Link Disclaimer](#) (Scientific Reports: 10; 10285)

Sterilisation Equipment, Disinfectant Guidance

The FDA has recently published an Enforcement Policy for Sterilisers, Disinfectant Devices, and Air Purifiers During the Coronavirus Disease 2019 (COVID-19) Public Health Emergency [7] that can be downloaded for review. Please note the markers are not tolerant to heat or steam sterilisation and have not been tested with any sterilisers.

References

1. Centers for Disease Control and Prevention Preventing 2019-nCoV from spreading to others. Available: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-prevent-spread.html> [Accessed 2 Sep 2020].
2. World Health Organization Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. Available: [https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-\(ncov\)-infection-is-suspected-20200125](https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125)
3. <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cleaning-disinfection.html> accessed 2nd September 2020.
4. <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2-covid-19> accessed 2nd September 2020.
5. <https://www.fda.gov/medical-devices/coronavirus-covid-19-and-medical-devices/uv-lights-and-lamps-ultraviolet-c-radiation-disinfection-and-coronavirus#coronavirus> accessed 2nd September 2020.
6. <https://www.nature.com/articles/s41598-020-67211-2.pdf> accessed 2nd September 2020.
7. <https://www.fda.gov/media/136533/download>