DDC

DDC · REDEFINING INFECTION CONTROL SINCE 1991

UVMATIC® WaterTrap

Water traps are some of the most contaminated areas in hospitals and increasingly recognised as potential vehicles for transmission of multi drug resistant organisms (MDROs) to patients. Water used for staff hand washing, hygiene of patients or washing devices is contaminated and then drained through the sinks, leading to the ideal environment for biofilm formation, which harbours MDROs, such as carbapenemase producing enterobacterales (CPE).

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Effective reduction of bacteria from wastewater in sinks and wash basins.

Washbasin water traps are some of the most contaminated areas in hospitals. For that reason, transmittance of MDROs from this area is increasingly recognised as a threat to patient health and safety.

A contaminated water trap under a sink or hand wash basin, actually demonstrates that a good level of hand hygiene is being practiced.

Bacteria from the hands are washed away and then remain inside the water trap.

Bacteria in water traps can be fed as solutions (such as IV fluid, drug preperations even soft drinks) are disposed of in sinks. These solutions can provide nutrients for the bacteria to thrive on and support biofilm growth.

Evidence indicates sinks and other drains, such as toilets or hoppers, in healthcare facilities can become contaminated with MDROs.

These pathogens can adhere to the pipes to form biofilms, allowing them to survive in drains for long periods and making them difficult or even impossible to fully remove. Every time the tap is run, bacteria are emitted which can travel a considerable distance from the sink or basin.

Since various types of MDROs can contaminate the same drain, drains can serve as sites where antibiotic-resistant genes are transferred between bacterial species.

Bottom or rear drain designs have water traps, as these are designed to prevent bad odour from coming back into the room from the drain network.

As water is run into the basin, MDROs are displaced and comes out into the room, where it can contaminate patients, staff and surfaces, leading to cross-infection. Water splashing also occurs leading to further contamination of the surrounding area.

A growing focus on the impact of contaminated water traps

- A unique product in the market
- Tested in clinical environment
- Documented efficacy - Significant reduction of colony forming units (CFUs) compared to control washbasin
- A cost effective solution to manage biofilm growth

Keep Your Environment Clean and Safe: Effective reduction of bacteria and biofilms

Elimination of Bacteria and Viruses: Harnessing the power of ultraviolet (UV-C) light

Prevents Cross-Contamination: Reduces the risk of cross-contamination

Clinical Study: A clinical study by Rigshospitalet, Copenhagen, Denmark

UVMATIC® WaterTrap

Test of water traps with UV-C at Rigshospitalet, Denmark:

After the product was developed, testing was carried out by the Department of Clinical Microbiology, Rigshospitalet, Copenhagen, Denmark.

Risghospitalet, is a 1,040 bed university hospital, with over 6,000 members of staff, looking after the specialist medical needs of patients living in Copenhagen.

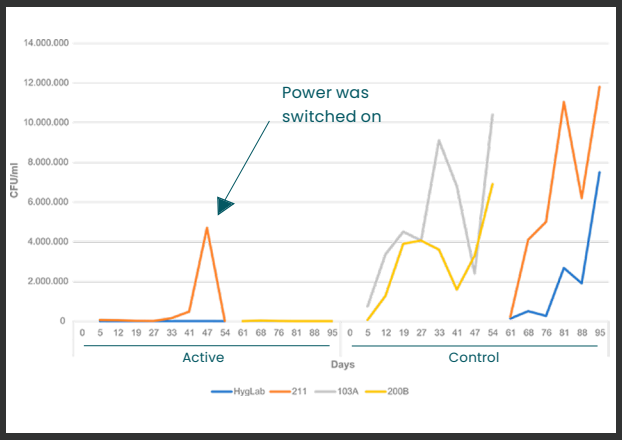
Testing was completed on 4 sinks, with 2 having the UVC disinfection switched on and 2 acting as the control with the UVC switched off for a 15-day period.

After the initial test had been completed, the 2 active sinks were switched off to become the control, and the other 2 sinks were switched on to become active.

Test swabs were taken at the beginning of each 15-day test, as well as every 3 to 4 days, in both the active and the control sinks.

Summary of results

UV-C decontamination of water traps reduces bacterial counts effectively within the first week of use. However, they are quickly recontaminated after discontinued UV-C exposure. UV-C decontamination of water traps may be a feasible adjunctive for prevention of spread of MDROs from washbasins to patients.



Part Numbers: UVMATIC® WaterTrap – 60-24-503
Replacement UVC bulb – 60-24-502

- Installation time & additional parts required will depend on the existing pipework & the availability of an electrical supply in the proximity to the sink / basin waste.
- Connection box that fits under the basin is waterproof and rated as IP67.

The solution:

- The DDC wash basin water trap disinfector operates 24/7 to constantly manage the build up of biofilms and pathogens.
- Consumes 11w per hour of electricity, so inexpensive to operate.
- Electrical safety tested to conform to EU and UK requirements.
- Uses UVC light radiation to destroy the DNA of pathogenic microorganisms such as bacteria, viruses and fungi, as well as removing unpleasant odours.
- The UVC lamp requires replacement annually.

Case study - Hospital Infection Research Laboratory, **University Hospitals Birmingham NHS Foundation Trust**

Hand wash basins are known to be reservoirs of MDROs. The presence of communities of microorganisms called biofilms, can promote prolonged survival of MDROs in wet environments such as hand wash basins (Hayward et al. 2024). Evidence demonstrating the transmission of MDROs from biofilms in wet environments (such as sinks and drains) to the healthcare and patient environment and the subsequent spread of infections to patients, is now recognised (Inkster 2024).

A recent investigation conducted in Germany (Fucini et al., 2023) has examined the link between sinks and healthcare associated infections (HCAIs). The study analysed HCAI surveillance data of 552 German ICUs, comparing infection rates in patient rooms with and without sinks. ICU patient rooms with sinks were associated with a higher number of HAIs, in comparison to rooms without sinks.

Outbreaks of MDROs including carbapenemase-producing organisms (CPO), have been linked to the presence of biofilms in hospital sinks. A Belgian study reported an outbreak affecting 37 patients (infected or colonised) over a 4 year period (Anantharajah et al. 2024). Using molecular methods an epidemiological link between clinical and environmental strains collected from sink drains was established.

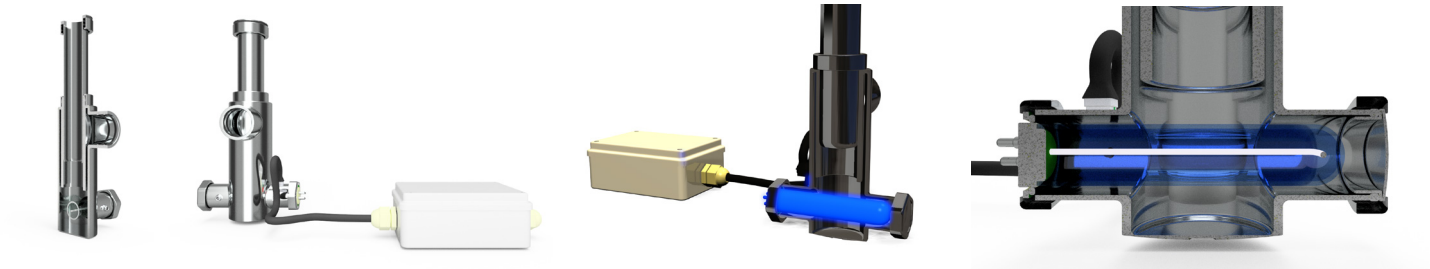
Eradication of biofilms within wet environments is notoriously challenging given their resistance to disinfectants, as well as difficulties ensuring disinfectants remain in contact with the biofilm for the required amount of time. UVMATIC® Water Trap by DDC offers a different approach to the control of bacteria and biofilms, harnessing the power of UV-C light to eliminate bacteria and reduce biofilm build up.

The Study

The UVMATIC® Water Trap System was tested in a hand wash basin located in the Hospital Infection Research Laboratory (HIRL) at University Hospitals Birmingham NHS Foundation Trust in Spring 2025. The study investigated the activity of the UV-C light emitted from the device against bacteria and biofilms located in the U-bend of the hand wash basin, over a 6 week period.

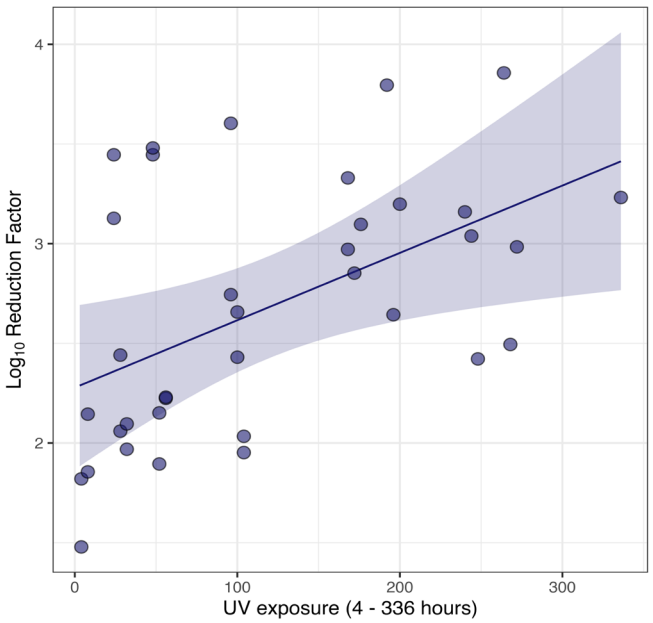
Water from the trap was taken at 3 time points of the day for 2 weeks to establish the baseline of bacterial contamination within the U-bend. Samples were plated onto agar plates and incubated. A total viable count (TVC) was recorded after 5 days incubation at 30°C.

Following 2 weeks of sampling the UVMATIC® Water Trap System was switched on to admit UV-C light directly into the U-bend, and remained on for 2 weeks. Samples were taken, repeating the same time points and enumeration method as above. Finally the UVMATIC® Water Trap System was switched off and samples collected for another 2 weeks.



Results

Following the UVMATIC® Water Trap System being switched on a gradual decrease in the number of bacteria being detected was observed. The figure shows the log reduction in viable bacteria in relationship to the amount of time the UVMATIC® Water Trap Sytem is turned on. As the UVMATIC® Water Trap System remains on for longer, the TVC in the water sampled from the U-bend reduces. The effect of the UVMATIC® Water Trap System was highly statistically significant ($p < 0.001$).



Conclusion

The use of UV-C in the UVMATIC® Water Trap System was able to reduce the level of bacterial contamination by over 99%. Once the UVMATIC® Water Trap System was switched off and the TVC started to rise again (data not shown), confirming the product is efficacious in the reduction and control of bacteria in the U-bend.

UVMATIC® Water Trap System offers a novel mechanism to control bacteria and biofilms in hand washing basins and overcomes the limitations of using disinfectants. UVMATIC® deploys the power of UV-C continuously and requires no human input (apart from the initial installation process) reducing transmission risk and supporting patient safety.

References

Anantharajah A, Goormaghtigh F, Nguvuyla Mantu E, Güler B, Bearzatto B, Momal A, Werion A, Hantson P, Kabamba-Mukadi B, Van Bambeke F, Rodriguez-Villalobos H, Verroken A. Long-term intensive care unit outbreak of carbapenemase-producing organisms associated with contaminated sink drains. J Hosp Infect. 2024 Jan;143:38-47. doi: 10.1016/j.jhin.2023.10.010. Epub 2023 Oct 28. PMID: 38295006.

Fucini GB, Geffers C, Schwab F, Behnke M, Sunder W, Moellmann J, Gastmeier P. Sinks in patient rooms in ICUs are associated with higher rates of hospital-acquired infection: a retrospective analysis of 552 ICUs. J Hosp Infect. 2023 Sep;139:99-105. doi: 10.1016/j.jhin.2023.05.018. Epub 2023 Jun 10. PMID: 37308060

Hayward C, Ross KE, Brown MH, Nisar MA, Hinds J, Jamieson T, Leterme SC, Whiley H. Handwashing basins and healthcare associated infections: Bacterial diversity in biofilms on faucets and drains. Sci Total Environ. 2024 Nov 1;949:175194. doi: 10.1016/j.scitotenv.2024.175194.

Inkster T. A narrative review and update on drain-related outbreaks. J Hosp Infect. 2024 Sep;151:33-44. doi: 10.1016/j.jhin.2024.05.016. Epub 2024 Jun 1. PMID: 38830539.

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