

Bio-decontamination of a newly renovated animal research facility using Hydrogen Peroxide Vapour

University College Cork, Ireland

Executive overview

A newly constructed animal research facility at University College Cork, Ireland required a 6-log biological decontamination to remove any potential bioburden to be performed within the entire facility between construction completion and the facility going live. Bioquell's RBDS was selected to offer a 6-log decontamination of the entire facility including its dedicated HVAC system using Hydrogen Peroxide Vapour.

After installing the equipment to perform the process, the decontamination cycle was run overnight with all equipment retrieved the following morning. The process was validated using industry standard 6-log biological indicators placed within the facility and chemical indicators within the HVAC duct work. The immediate results from the chemical indicators and of the biological indicators following a period of incubation confirmed that a 6-log reduction in bioburden was achieved in the entire facility, including within the HVAC duct work. This allowed UCC to rapidly bring the facility into service after the process was complete. UCC have also purchased a suite of Bioquell equipment to perform regular decontamination cycles within the facility.



The background

A newly constructed multi-storey animal research facility at University College Cork, Ireland was looking to achieve a 6-log biological reduction within the facility to reduce the level of environmental bioburden before the facility went live. No specific contamination was detected within the facility, but due to the amount of construction activity that had taken place within the area, biological decontamination was required as a precautionary measure.



The challenge

It was necessary to decontaminate the entire facility as one discrete zone to prevent any cross-contamination between areas, and it was also necessary to decontaminate the HVAC duct work supplying air to the facility to prevent recontamination into the facility from any potential bioburden within the ducting. It was also important that the process was fully documented for auditing and regulatory inspections.

“Decontaminating a newly constructed animal facility before it goes live is a critical step to reduce the risk of bioburden. The ability of Bioquell’s RBDS to perform a 6-log decontamination of a facility of this scale (including its HVAC duct work) and to treat it as one discrete zone is a very useful tool in preparing an animal facility for use.”

Chris Berridge,
Bioquell RBDS Project Manager

The solution

After reviewing the marketplace for potential bio-decontamination specialists, the Bioquell RBDS service was chosen by UCC to establish a degree of sterility as high as practically possible within the facility and its associated HVAC system using Bioquell’s scientifically-proven Hydrogen Peroxide Vapour technology.

The strategy chosen was to decontaminate the ventilation system prior to the facility. This meant that any potential contamination within the duct work would be ‘pushed into’ the facility before it was decontaminated, which would prevent any recontamination of the facility from the HVAC.



The deployment

The multi-storey animal facility consisted of 50 rooms and was 2,500m³ in volume. Eighteen of Bioquell's Hydrogen Peroxide Vapour generator units were positioned between both floors to decontaminate the area effectively. An additional three generators were also placed in the plant room to decontaminate the HVAC supply duct work responsible for feeding clean air into the facility. As shown in Diagram 1, using specially fitted hoses and a custom made blanking plate, the generators injected vapour directly into the air handling unit which was pulsed to push the vapour into the entire network of ducting.

Bioquell Biological indicators (*Geobacillus stearothermophilus* spores) were used to demonstrate the efficacy of the process. They were placed in 94 locations within the facility. Chemical indicators were also placed in the supply and extract legs of the duct work to demonstrate the efficacy of the process within the HVAC.

During the day, the Bioquell team installed and tested the equipment required to perform the process, and after sealing all doors to the facility the decontamination cycle was run overnight. Following the decontamination, the Bioquell team entered the facility the following morning abiding by all gowning procedures and barrier protocols to retrieve the equipment and indicators.

Using low level Hydrogen Peroxide Vapour sensors the perimeter of the zone was regularly monitored for any Hydrogen Peroxide Vapour leakage throughout the cycle. Following cycle completion in addition to reactivating the HVAC system, Bioquell's catalytic aeration units placed within the facility were also activated to break down the Hydrogen Peroxide Vapour within the zone into oxygen and water, taking place overnight.



Diagram 1. Hydrogen Peroxide Vapour injection into the air handling unit

Results

Upon completion of the decontamination process all the CIs placed in the duct work were retrieved and showed that a 6-log decontamination had been achieved. Following the standard 7-day incubation period, no growth was observed in 100% of the 94 BIs retrieved from the suite. This proved that a 6-log reduction in bioburden level was achieved in all areas within the scope. All electronic equipment within the facility was exposed to the Hydrogen Peroxide Vapour, with motorized equipment left running throughout. All equipment was confirmed to be in perfect working order following the suite decontamination. There was also excellent compatibility noted with all interior building surfaces.

Outcomes

The entire animal facility including specific equipment and its dedicated HVAC system achieved a 6-log reduction in bioburden as demonstrated by the BIs within the facility and CIs in the HVAC duct work. The quick turnaround of the process ensured that the facility was brought back into service quickly. Following the successful delivery of this project, UCC have purchased a suite of Bioquell equipment to perform regular decontamination cycles of single rooms within the facility.

Your local distributor:

Disclaimer: Please note that this document comprises marketing literature and is for summary information purposes only; customers or potential customers must not rely upon the contents of this document. Bioquell UK Ltd or its affiliates, distributors, agents or licensees (together 'Bioquell') reserve the right to make changes to the contents of this document at any time and without prior notification. Use Bioquell Hydrogen Peroxide Vapour safely. Always read the label and product information before use.

Bioquell is a registered trade mark of Bioquell UK Ltd.
© Bioquell UK Ltd (2017). All rights reserved.

E: info@bioquell.com
W: www.bioquell.com

Bioquell UK
T: +44 (0)1264 835 835

Bioquell USA
T: +1 (215) 682 0225

Bioquell Germany
T: +49 (0)221 168 996 74

Bioquell Ireland
T: +353 (0)61 603 622

Bioquell Asia Pacific
T: +65 6592 5145

Bioquell France
T: +33 (0)1 43 78 15 94

Bioquell China
T: +86 755 8631 0348

