

# Fumigation of an Ambulance using Hydrogen Peroxide Vapour (HPV) in under 1 hour

## Hampshire Ambulance Service, Southampton, UK

### The Challenge

Ambulances pose a credible risk of infection acquisition to patients due to interiors contaminated with nosocomial pathogens. Hampshire Ambulance Trust required a rapid, effective solution, able to decontaminate ambulances that had previously carried infectious patients. Due to the heavy demands placed on the ambulance service it was imperative for any solution to minimise vehicle 'down-time' if it were to be logistically viable.



### Solution

BIOQUELL conducted a trial in conjunction with The Hampshire Ambulance Trust, deploying the Room Bio-Decontamination Service (RBDS) to fumigate their ambulances. The proven efficacy of Hydrogen Peroxide Vapour (HPV) against MRSA, *C.difficile* and other hospital acquired pathogens, and the benefits of a residue-free process makes RBDS ideal for this application. A Clarus™ R HPV generator was strategically placed in the ambulance alongside two Clarus™ R2 aeration units to remove the HPV upon completion of the injection phase of the cycle.

An instrumentation module was also placed inside the ambulance in order to carefully monitor the key cycle parameters via a real-time link to the external control computer.

One of the primary advantages of the RBDS system is that all of the paramedic equipment contained within the ambulance was able to remain 'in-situ' during the cycle enabling complete fumigation of not only the vehicle's surface interior, but also the medical equipment held within.

RBDS engineers sealed off the treatment area and cab of the ambulance thus allowing Hampshire Ambulance Trust mechanics to safely continue essential maintenance whilst the decontamination cycle was in progress, therefore no additional vehicle 'down-time' to the routine maintenance schedule was required.

The RBDS decontamination cycle was completed within 1 hour after which the vehicle was totally free of HPV and able to be safely returned to ambulance crews for immediate re-deployment.

### Gassing Cycle Verification

The efficacy of the fumigation was validated using biological indicators. 6-log inoculums of *Geobacillus stearothermophilus* spores dried onto stainless steel discs and placed in Tyvek pouches were used as biological indicators (BIs) to validate the gassing cycle. Six BIs were placed in challenging locations around the ambulance, including below the stretcher trolley, inside a medicine rack and behind items in a storage void.



The BIs were retrieved after the aeration phase of the decontamination and incubated for 7 days at 60°C. Two positive controls and one negative control were also incubated with the BIs. After incubation only the positive controls showed signs of growth, thus confirming a full 6-log reduction of *G. stearothermophilus* spores throughout the treatment area, and driver's cab of the ambulance.

### Conclusion

The target of achieving a 6-log reduction in *G. stearothermophilus* spores was demonstrated in the treatment and cab areas of the ambulance and of all the equipment within. RBDS provides an effective, low temperature and residue free fumigation system, which combined with the rapid aeration method, produces a minimal complete cycle time, of less than 1 hour. Since the decontamination process was carried out alongside the scheduled maintenance, no additional vehicle 'down-time' was required, allowing the ambulance to be quickly and safely returned to crews within the hour.

Richard Diment, Chief Executive of the Ambulance Service Association states "Reducing Healthcare Acquired Infection is a priority for all parts of the NHS including ambulance services"; the RBDS system has proven efficacy against environmentally associated nosocomial pathogens giving the RBDS service many applications within healthcare sectors.

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