

Case Study: Pre-Occupation Bio-Decontamination of a 25,000m³ Biomedical Research Facility.

Client:	Biomedical Research Council; A*Star BIOPOLIS
Location:	Singapore

The Challenge

A major new bio-medical research facility comprising of two research centres measuring 15,000m³ and 10,000m³ respectively were constructed in Singapore for lease to private researchers worldwide. Upon completion of the facility a viable, flexible, rapid bio-decontamination solution was required before the facility was able to go 'on-line'.

Solution

A*Star selected BIOQUELL's Clarus™ technology to perform the bio-decontamination contract due to the speed and flexibility of the RBDS service, which were able to bio-decontaminate both facilities over 9 days in two deployments.

A project of this magnitude requires a substantial amount of pre-project planning, with the BIOQUELL RBDS Project Manager liaising with client personnel during every stage of pre-deployment planning. The target areas were divided into bio-decontamination zones on the basis of target area topology, client requirements, and other logistical considerations. Each zone was bio-decontaminated as a discrete zone with exact cycle parameters calculated to match the unique target area.

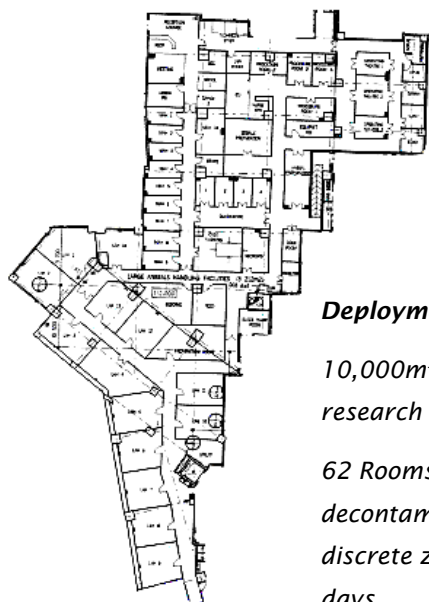


Clarus™ R hydrogen peroxide gas generators were strategically placed within the facility in-order to ensure optimum gas distribution along with Clarus™ R2 aeration units which catalytically process the hydrogen peroxide gas upon completion of the injection phase.

Instrumentation modules were also placed within the facility giving RBDS engineers a live 'real time' data feed of the key cycle parameters via external control computers from which RBDS engineers control the whole cycle remotely, giving unparalleled safety management of the whole bio-decontamination process.

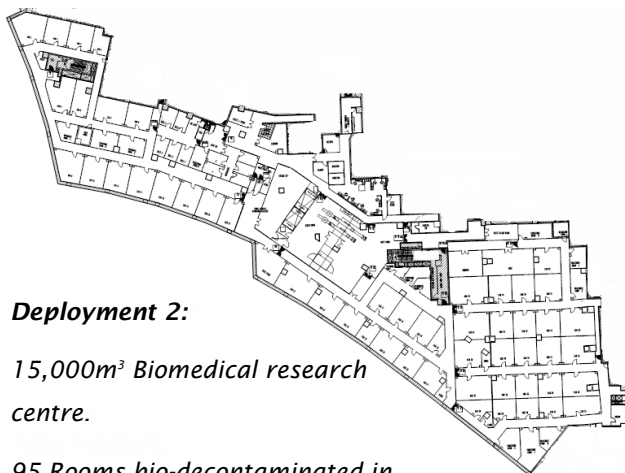
Background: Bio-decontamination within a room or chamber is achieved by depositing an even layer of 'micro-condensation' of H₂O₂ over all surfaces. The term 'micro-condensation' may be defined as a microscopic film of H₂O₂, which being at a sub-micron level is invisible to the naked eye. Scientific research has proven that it is this low temperature, residue-free deposit that rapidly deactivates micro-organisms during the gassing process.



**Deployment 1:**

10,000m³ Biomedical
research centre.

62 Rooms bio-
decontaminated in 5
discrete zones over 4
days.

**Deployment 2:**

15,000m³ Biomedical research
centre.

95 Rooms bio-decontaminated in
5 zones over 5 days.

Gassing Cycle Verification

The efficacy of the bio-decontamination cycle was validated using biological indicators. 6-log inoculums of *Geobacillus stearothermophilus* spores dried onto metal discs and placed in tyvek pouches were used as biological indicators (BIs) to validate the gassing cycle. Over 630 6-log BIs were placed throughout the facilities in challenging locations.

The BIs were retrieved upon completion of the bio-decontamination cycle and incubated for 7 days at 60°C along with positive and negative controls.

Results

Of the 630+ BIs used in the bio-decontamination, a single BI exhibited signs of growth during incubation, although all other BIs present within the same room were fully de-activated, BIOQUELL performed a remedial bio-decontamination cycle immediately completing the bio-decontamination ahead of schedule.

Conclusion

The bio-deactivation target of a 6-log reduction in *G. stearothermophilus* spores was demonstrated throughout the target areas. The Clarus™ R provides a rapid and effective bio-decontamination system, which combined with the rapid aeration method produces a minimal complete cycle time, thus minimising the 'down-time' of a facility.

This system can be used in many other applications such as bio-decontamination of specific problem-causing micro-organisms or for general bio-decontamination of laboratories, including CL3 facilities, cleanrooms, pharmaceutical production facilities, etc. The Clarus™ R system is infinitely scalable so that very large areas and entire suites can be rapidly and effectively bio-decontaminated.

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