BIODECONTA

Creating a Smart and Secure Sterile **Environment**

www.biodeconta.ca

Founded in 2016, Biodeconta is dedicated to "Creating a smart and secure sterile environment. We specialize in advanced technologies that serve critical sectors including biosafety, aseptic pharmaceutical manufacturing, and medical disease control.

Our comprehensive offerings include:

- Cleaning validation and bio-decontamination services
- Hydrogen peroxide decontamination systems
- Glove integrity testing systems
- Sterile consumables, such as biological indicators and isolator gloves

At Biodeconta, we are committed to technological innovation, strategic growth, and fostering a positive, collaborative, and passionate corporate culture. These principles guide our mission to deliver excellence and build lasting impact across the industries we serve.

Driven by innovation and precision, Biodeconta is committed to becoming a leading provider of intelligent bio-decontamination systems and services. We help our clients build trustworthy, compliant, and technologically advanced sterile environments that meet the highest global standards.

Our core values are:

Customer-Centricity
Deeply understanding client needs and delivering trustworthy,high-quality solutions.

Collaborative Success
Growing together with partners and co-creating value with our employees.

Continuous Innovation
Driving industry progress through technology and empowering the future with intelligence.

Accountability
Upholding professional integrity and fulfilling our corporate social responsibilities.

Golden Hive Series: High-Performance Hydrogen Peroxide Bio-decontamination

The Biodeconta service team utilizes the Golden Hive series of high-performance hydrogen peroxide generators to deliver on-site biological decontamination services for a wide range of professional clients. Now in its third generation of upgrades, the Golden Hive system provides reliable and high-level bio-decontamination across diverse environments.

Among its models, the Hornet stands out for its compact design and optimized airflow distribution, enabling precise control of vapor quality. This ensures effective microbial inactivation while minimizing the risk of material corrosion—a critical factor in sensitive environments.

The system is engineered to activate and perform environmental decontamination even under harsh conditions where the initial ambient humidity reaches as high as 60%—without condensation, ensuring consistent performance in challenging environments. It achieves six-log (10^6) microbial reduction, meeting stringent bio-decontamination standards.

The Golden Hive series has been successfully deployed in BSL-3 laboratories, egg surface disinfection, and other demanding applications, making it a trusted and high-quality solution for professional biological decontamination needs.

01 STEP

Technical Consultation & Protocol Development

Our team conducts an on-site assessment of the environment, layout, and critical control points. In close collaboration with the client, we develop a tailored purification and validation protocol.

02 STEP

Equipment Setup & Area Sealing

After verifying equipment functionality and environmental readiness, the team ensures the area is vacated and sealed. Once all parameters are confirmed, the system is remotely activated to begin biological decontamination.

03 STEP

Site Preparation

Service engineers arrive with the necessary equipment and don protective gear. They then position the devices, biological indicators, and chemical indicator cards according to the planned layout.

04 STEP

Post-Process Handling

Upon completion, service engineers re-enter the site to retrieve equipment and collect indicators. They assist the client in incubating biological indicators and issue a comprehensive decontamination report, completing the validation documentation.

05 STEP

Vapor Phase Operation

The equipment dynamically adjusts its operating parameters in real time based on environmental conditions, ensuring a safe, rapid, and effective sterilization process.

BIODECONTA Hydrogen Peroxide Generator – Hornet S1.1

The Golden Hive Hornet S1.1 is the latest generation of hydrogen peroxide vapor generators used by Biodeconta. Each unit is equipped with a Vaisala HPP272 hydrogen peroxide sensor from Finland, enabling real-time monitoring of key environmental parameters and dynamic adjustment of operating conditions.

The system monitors:

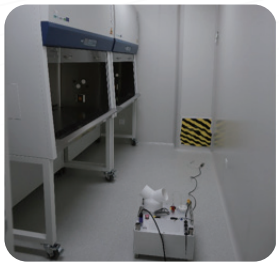
- Temperature
- Water vapor partial pressure
- Saturation vapor partial pressure
- Vapor-phase dew point

Unlike traditional generators with fixed injection rates, the Hornet S1.1 automatically adjusts its injection speed, evaporator plate temperature, and other variables based on real-time environmental data, ensuring efficient decontamination while minimizing the risk of condensation-related damage.

Case Photos of Hornet S1.1 On-Site Decontamination:

GMP Workshop

National Laboratory



National Laboratory

ABSL-3 Laboratory

Examples of objects in the laboratory being oxidized by hydrogen peroxide

Hornet S1.1
Key Technical Advantages

Swarm-Based Operational Design:

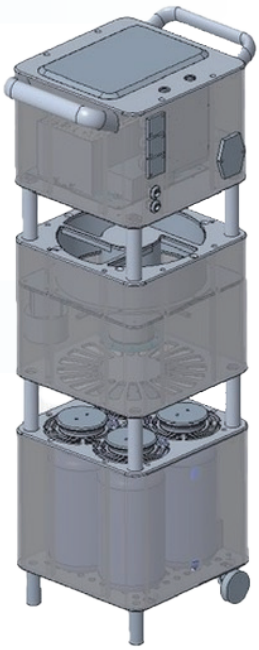
Each Hornet S1.1 can effectively cover a volume of 150 m2 and operates independently with its own HPP272 sensor to monitor and control local vapor quality. Multiple Hornet S1.1 units form the Golden Hive swarm, a coordinated system offering superior environmental control compared to conventional generators—especially in complex or large spaces.

Optimized Airflow Distribution:

Featuring a tri-layer “sandwich” structure with high-powered airflow modules and integrated impeller cups, the Hornet S1.1 achieves exceptional vapor dispersion—even in demanding conditions—with no need for auxiliary airflow disturbance equipment.

Wireless Control:

Operators can remotely monitor and control the Hornet S1.1 from outside the decontamination zone via tablet interface. This wireless design enhances operational safety and convenience.



Full-Cycle Data Acquisition & Validation:

Throughout the vaporization process, the Hornet S1.1 continuously records environmental data and automatically generates a comprehensive report post-operation. This allows clients to directly visualize the complete decontamination parameters, including the uniformity of vapor flow and concentration distribution—a significant advantage over traditional systems.

Biological Decontamination in a Level 3 Animal Biosafety Laboratory (ABSL-3)

A client operating multiple ABSL-3 animal biosafety laboratories requires two types of biological decontamination, both using vaporized hydrogen peroxide (VHP):

Routine Decontamination Before and After Experiments

In this mode, decontamination is performed without activating the HVAC system and excludes treatment of pipelines and BIBO exhaust units.

Comprehensive HVAC-Integrated Sterilization

This approach includes full-area decontamination, covering both the environmental surfaces and the HVAC systems.

Due to the large size of the client's laboratory spaces, a zone-based mobile sterilization strategy was employed. The previous method relied on bulky VHP generators supplemented with fans to assist vapor diffusion. Over time, the client encountered significant drawbacks:

- Poor condensation control, leading to oxidative damage within the lab
- Cumbersome equipment, resulting in inconvenient operation and high maintenance costs

To address these issues, the Biodeconta service team implemented the Golden Hive generator system for sterilization. Based on room layout and volume, Hornet S1.1 units and sensors were strategically placed throughout each HVAC-controlled lab. Decontamination was conducted in both HVAC-active and HVAC-inactive scenarios, achieving a consistent six-log (10^6) microbial reduction across all zones.

Despite the laboratory's limited dehumidification capacity, the Hornet S1.1 successfully operated at 60% relative humidity without condensation, demonstrating the system's excellent distributed design and precise local vapor control capabilities.

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