Emma Gibbons

Senior Project Manager

Gives an in-depth interview on PBSC's Material Decontamination Chambers

PBSC's High Level Log6 Surface Disinfection Chamber

Allow us to introduce Emma Gibbons, our Senior Project Manager. Emma joined our team in early 2020 and holds a 1st class degree in Mechanical Engineering from Northumbria University.

Prior to joining us, she worked as a Project Engineer and Engineering Team Manager at GlaxoSmithKline, here Emma oversaw the engineering teams responsible for Aseptic and Terminally Sterilized products within the Steriles Business unit.

In 2018, she moved to Yorkshire and worked at SCAPA Healthcare in the Medical Device Industry, engineering equipment for Advanced Wound Care product manufacturing.

Since joining PBSC, Emma got married and has become an integral member of the MDS department. She is now leading the Project Management Team across all departments.

What are PBSC's Decontamination Chambers?

The high-level log6 surface disinfection chamber is a modular unit specifically engineered for material decontamination of equipment loads in cleanroom and high containment facilities up to BSL4. This freestanding unit is highly versatile and can be used in a variety of environments.

Our chambers come in two different types: MD-C and MD-Ci.

Each is designed to meet different needs. The MD-C comes with a mobile generator, which can be used with other equipment, while the MD-Ci has an integrated generator and is ideal for situations where there's limited floor space.

Both options are a modular design that fits the customer's space and load requirements. Additionally, they have a flush-mounted threshold, making it easy to move trolleys, and an intuitive software design, with various air handling and aeration configurations. Both chamber designs have a decontamination cycle time from 45 minutes. The decontamination cycle is initiated via the colour touch screens, which are located on either side of the chamber, providing operators with in-cycle data from the chamber and H_2O_2 generator. Depending on the generator type, the bottle housing, and thermal printer can be mounted directly onto the Chamber.

Effective against a wide range of microorganisms and viruses, the H_2O_2 disinfection chamber provides a low heat decontamination solution for heat-sensitive items such as laptops and biological preparations. The chamber is a crucial addition to a facility's process philosophy for material transfer into or out of the critical environment.

At PBSC we provide decontamination solutions from market leading H_2O_2 generator manufacturers ensuring regulatory compliance and consumable traceability.

How does this product help the end user?

The Chamber is responsible for managing the process sequence, monitoring crucial parameters, and raising alarms for mechanical, electrical, and process parameters as needed in the control solution. Additionally, it ensures the software is in place to protect personnel and equipment during process operations.

Pharma Sector

PBSC mainly provides chamber solutions to the pharma/ biopharma industry, where fast cycle times are essential for meeting production demands.

To ensure reliable daily use, we have focused on developing robust and repeatable solutions. Our range of solutions can be configured to meet the specific needs of customers, even in limited layout spaces.

We have successfully validated cycle times as short as 45 minutes with a log6 kill, although cycle times may vary depending on the load absorbency and surface area.

Biomedical Sector

Many end-users still rely on manual spray disinfection, but this is likely to change due to stricter regulations.

One process that requires the use of chambers is bioburden reduction for items or equipment that cannot be autoclaved, this applies to both goods entering a facility and leaving a laboratory, depending on the activities of the end-user.

Containment Sector

When producing dangerous pathogens that can harm humans or animals with or without a cure, it's crucial to decontaminate all equipment leaving the laboratories using log6 decontamination.

While Formaldehyde is currently the preferred method, its use is becoming more restricted, so there is a shift towards using hydrogen peroxide. PBSC offers solutions for both types of decontamination.

What additions are available?

The decontamination chamber can be setup to run the following mode of operation:

- H_2O_2 Cycle – Log6 sporicidal decontamination utilizing H_2O_2
- Air Clean Cycle – A method of material transfer using timed air particulate clean up only.
- Ultra Violet (UV) Light Cycle – Timed UV light decontamination cycle.
- UV and Air Clean Cycle – Combination of both cycles.

Standard Features:

- Flush threshold
- Chamber utilizes the customer's existing floor so a pit is not required.
- Large double-glazed vision panels on doors.
- Internal electrical sockets.
- Integrated generator bottle housing.
- Internal lighting.
- Modular (flat pack) construction.
- Constant door seal pressure monitoring.
- Colour touch screen on both sides of the chamber.
- Chambers are made from stainless steel 304 and can be upgraded to 316L.

Optional Additions - Air Handling:

The 3-valve system consists of :

- Independent Air Handling Solution (AHS) using a PBSC supply inlet fan. Alternatively the 3-valve system can be supplied without the fan if the customer wishes to use their HVAC
- Supply, Extract, and Bypass valves to ensure correct airflow paths when in standby or gassing modes.
- H14 HEPA filter for air supply to the Chamber with an option of low level return plenums to support uni-directional air flow.

The 2-valve system consists of:

- The 2-valve system uses the building HVAC but with PBSC supply and extract Valves
- PBSC control system integrated with client BMS (Building Management System) for the valve sequencing

Customer Supply HVAC valves:

- The Customer will supply the HVAC isolation valves.

Pressure Control:

- Utilizing the control system with P&ID loop pressure sensor feedback, the fan speed of the extract unit can be controlled to achieve a pressure setpoint within the chamber

MVS (Mechanical Vent System):

- The MVS can only be used with a customer HVAC supply.
- During a decontamination cycle the chamber will control the pressure within the chamber via solenoids connected above the HVAC isolation valves. This gives access to positive and negative pressure to the chamber.

What additions are available? (continued)

- The internal pressure is monitored via the PLC

Recirculation Fan:

- Typically in BSL3 facilities there will be a requirement to decontaminate filters before air removal.
- PBSC can provide a fan recirculation system that will decontaminate the filters during the decontamination cycle.
- This is a timed, PLC controlled function.
- The system consists of a fan, valve and pressure switch to check fan operation.

Optional Additions – Extract Units:

- PBSC can provide standard extract units with built-in carbon filters for the exhaust of air to the external environment.
- The PBSC SMF system is a H_2O_2 full scrub filter system. During the aeration phase of the cycle, the catalytic filter in the SMF unit removes all H_2O_2 before it returns to the room. This allows the PBSC chamber to be completely independent of a building HVAC system.
- The units can work at 400m^3/hr, 800m^3/hr or 1000m^3/hr.

Optional Additions – Pressure Relief:

- During a decontamination cycle warm/hot air is introduced into the chamber via the decontamination generator.
- The filter pack allows the over pressure to be release to a controlled area.
- The filter pack consists of a HEPA/Carbon/HEPA filter configuration.

Optional Additions –Pressure Testing:

- If a generator has a pressure test capability the filter pack can be fitted with a valve to allow the pressure test.
- A Chamber pressure sensor is available to monitor the chamber pressure or to enable the Chamber's built-in pressure test feature. Pressure tests can also be conducted using the MVS system.

Optional Additions – Aeration Units:

- To aid in the removal of H_2O_2 during the aeration phase PBSC can add either single or double aeration units
- Aeration 2400 – produces 2400m^3/hr through carbon and HEPA filter.

Optional Additions – Instrumentation:

- The following sensors are available for integration with the Chamber:
- RH/Temperature sensor.
- High level internal H_2O_2 sensor.
- Low Level internal H_2O_2 sensor.
- Low level External H_2O_2 sensors (both sides).
- Low level External H_2O_2 sensor (technical space).

Optional Additions – Automation/Software Hardware: Technical area screen:

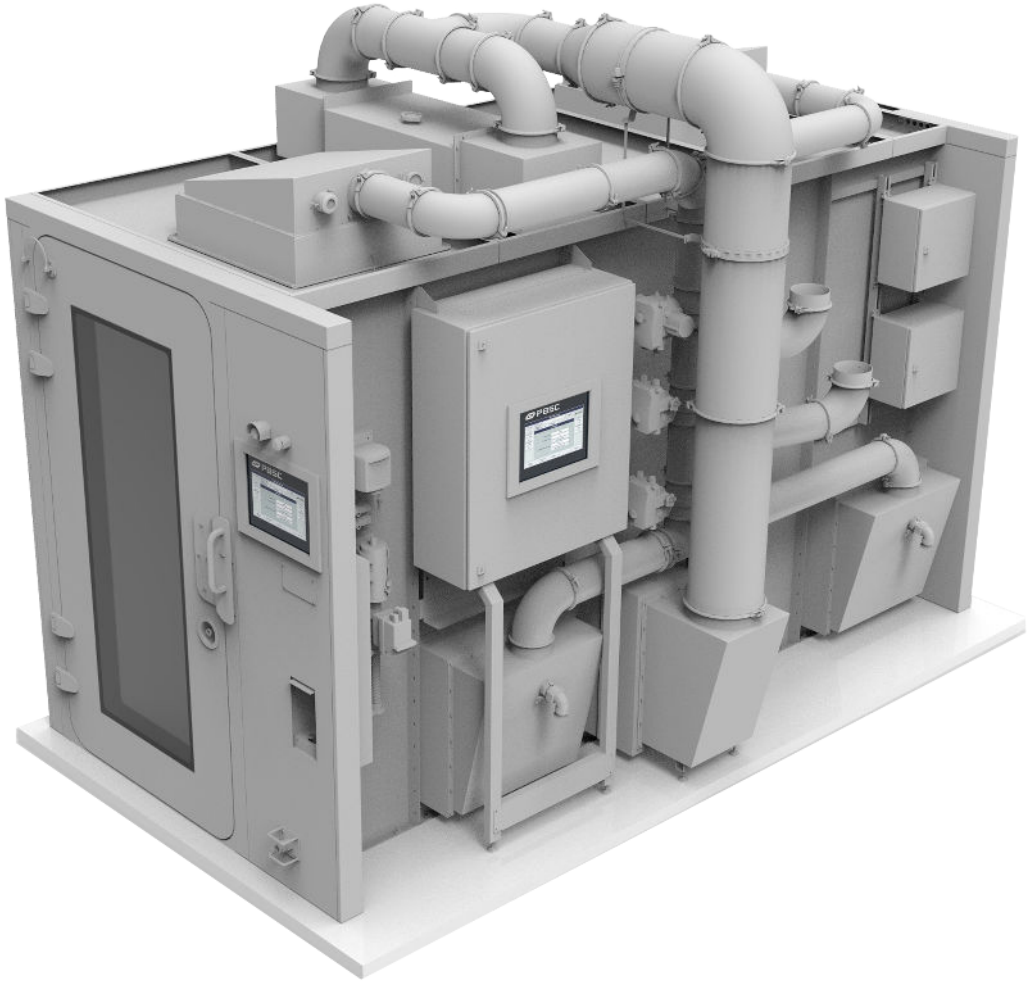
- Cycle PDF available from screens.
- Connection to access directory available.
- Connection to NTP time server available.
- Electronic signatures.
- Live data available over ethernet.
- S1200 or S1500 PLC - with twin touch screens.
- Multiple Screen sizes. Most common being 7" or 12" screens.
- UL508A certification.
- Optional upgrade of Windows 10 based operating system

Optional Additions – BMS Signals:

Via volt free contacts, it is possible for BMS signals such as critical alarms, and HVAC signals to be made available to the customer's BMS system.

What companies have been associated with this product?

Multiple across UK, Europe, America and Asia.



PBSC Staying in Control of Controlled Environments

Established in 1987 PBSC has become one of the leading manufacturers of cleanroom, high containment and material decontamination products throughout the world and having the extensive product range and bespoke designs and assembly capabilities can meet customers needs.

Providing high quality products and services to the pharmaceutical, medical research, high containment and hospital sectors, offering quick and accurate assistance during project planning to consultants, architects and end users.

PBSC have agents and representatives in most countries to provide excellent local support and logistical services to make sure your products arrive on time.

Products include;

- Cleanroom Doors
- Pneumatic Inflatable Seal /Airtight Door Sets
- Mechanical Seal / Airtight Doors
- Material Decontamination Chambers
- Transfer Hatches / Cleanroom Pass Through
- Fogging Showers / Mist Showers
- Air Showers

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