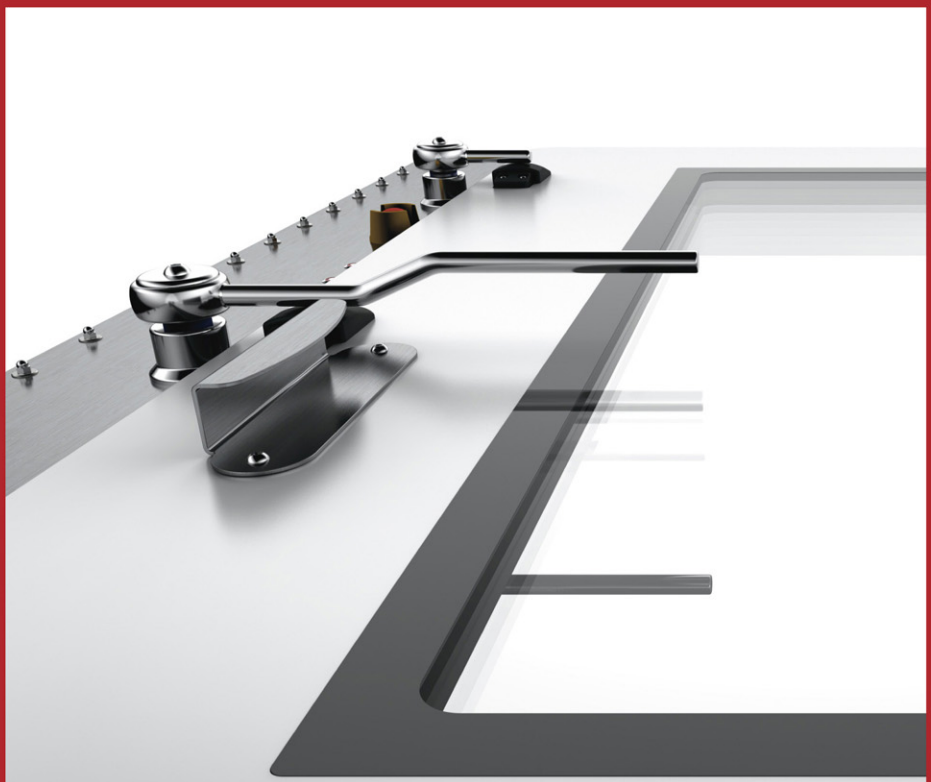


CONTENTS

PRESRAY

IN PARTNERSHIP WITH **PBSC**

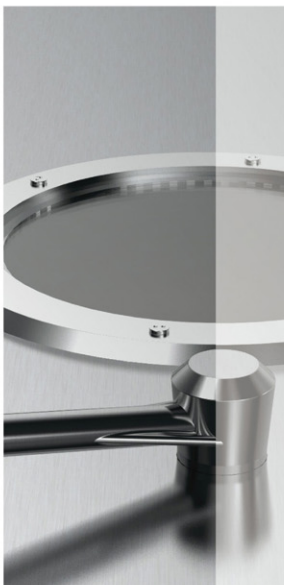
A Partnership in Critical Containment…

The breadth and depth of **PBSC's** product offering for laboratories and cleanrooms has been significantly expanded as a result of our partnership with US-based, **Presray**. Our product offerings compliment each other brilliantly. Together, our containment solutions provide an unmatched one-stop source for all of your critical biosafety and bio-security needs.

About Presray…

Presray started in the Nuclear sector in the 1960's and specialize in providing high quality, robust pneumatic and mechanical seal doors to the **BSL3-Ag** and **BSL4-Ag** sector.

Welcome



The safety and security of high containment and cleanroom facilities has never been more challenging. With a background in the Pharmaceutical Industry, **PBSC** entered the High Containment sector by producing pneumatic seal doors. Today, we meet the wide spectrum of containment needs for state-of-the-art biohazard facilities and cleanroom environments, whether it is a new build or a retrofit.

As standards and regulations become more demanding, the technology to meet those requirements continues to evolve as well. Your facility may be small or large, but the fundamentals remain the same. Keep hazardous agents contained where they belong and control human access to potential contaminants inside your critical containment area.

Functional and aesthetic requirements are changing faster than ever and **PBSC** stays ahead of the curve through rigorous testing, training, product innovation and strategic partnerships. An example of this commitment is our new partnership with **Presray** in the United States and strong relationships with other suppliers around the world.

Every product you see in this brochure is based on a proven design that if required can be customised to meet the right balance between functionality, ease of use, aesthetics and cost.

We look forward to working together in the near future.

With warm regards,

The PBSC Team

Integrated H2O2 Generator Solutions

A truly integrated Solution

Our large capacity **Material Air Lock (MAL)** and pass through chamber are available with the state-of-the-art Bioquell HPV Integrated generator, using Bioquell's patented dual loop technology for added efficiency.

The generator is built into the chambers and operation is very simple with the H2O2 loading bottle and printer on the chamber next to the high performance pneumatic seal door. The entire cycle is run via the colour touch screens on each side of the chamber, which gives information on all the chamber parameters and condition of the integrated generator.

As with the chambers on pages **8** to **11** the chamber is fitted with an onboard PLC that monitors all critical parameters of each cycle.

There are various chamber sizes with either solid core or stainless steel pneumatic seal doors available.

Walk in Chamber

Installation into existing facilities where space is limited is not a problem as the chamber is delivered in panels which will fit through a single door way and assembled on site with NO NEED for a pit in the floor. The chamber can operate with connection to the **HVAC** system or can be fitted with the **APB (Air Purge Boost)** system which takes the fresh air through the chamber which is able to be ducted direct to atmosphere, providing quick reliable and safe cycles without any added strain to the **HVAC** system.

Key Features

- Safe and Reliable Decontamination
- Doesn't need to be connected to building HVAC system
- No Pit Required
- Service from the front of the chamber
- Flush Threshold – Easy Wheeled Access
- Fast Cycles from 50 minutes

Fumigation Pass Through

The unit is delivered pre-assembled and will need an access route to be checked. The unit fits onto a finished floor. The pass through is connected to a constant extraction which can be to a HVAC system or direct to atmosphere.

Key Features

- Range of transfer systems available
- Easy service access
- Cycle times from 30 minutes
- No need to connect to the HVAC system with the APB unit fitted
- Validated Log 6 cycles

Material Air Lock (MAL) Decontamination Chamber

A decontamination solution that stands alone

Our large capacity high level surface disinfection chamber is a freestanding, modular unit that makes expensive room adapted chambers obsolete — ideal for large material and equipment loads in laboratories and clean rooms. It comes configured to plug and play with a state-of-the-art Bioquell HPV generator, but can be easily adapted for other decontamination chemicals, such as formaldehyde.

Effective against a wide range of microorganisms and viruses, the **MAL** chamber is much more energy efficient and gentle on equipment than autoclaves. With a **HPV** generator, it can even be used on electronics such as laptops and calibration devices.

The chamber is fitted with an onboard PLC that monitors all critical parameters of each cycle. Various chamber sizes and both solid core or stainless steel pneumatic seal doors are available. Available with Integrated Generator.

Applications

For material loads or equipment entering or exiting controlled areas, where validated cycles are required. Used widely in high containment facilities to surface bio-decontaminate materials throughout the healthcare, life sciences, pharmaceutical, food and defence sectors.

In the pharmaceutical sector the chambers are used for products entering the cleanrooms and are versatile enough to decontaminate goods exiting the cleanrooms via a supervisor password while still maintaining the environment. There is an air clean cycle where the chamber will go through a particulate clean up cycle, instead of a bio-decontamination cycle. Enabling it to be used as a standard pass through when required.

Key Features

- No pit required
- Can be used with hydrogen peroxide or formaldehyde
- Flush thresholds allows for easy loading/unloading of carts
- Decontamination cycle times as short as 1 hour
- Range of aeration options to suit customers requirements
- Readily available spare parts for easy maintenance and servicing
- On-board compressed air supply available
- Validated Log 6 cycles decontamination with a Bioquell HPV system

HPV CHAMBERS SUPPLIED WITH:

- Project Specific Approval Drawing
- Installation of Unit
- Wiring of Chamber
- Commissioning of Chamber
- IQ-OQ
- Operator training
- Gas Cycle Development
- Performance Qualification
- 6 or 12 monthly servicing/calibration

Decontamination Pass Through

The ideal smaller capacity Material Air Lock (MAL) decontamination system

This space efficient chamber is ideal for handling carts and materials crossing your facility's containment line. When fitted with the ingenious cart-to-cart transfer system, goods and equipment can be decontaminated and transferred quickly and safely through the hatch. The cart system also provides a consistent load presentation in the hatch, to assist in repeatable decontamination cycles.

Like our large capacity MAL Decontamination Chamber, the chamber is designed to interface with a **Bioquell Clarus** generator, but can be easily adapted for other decontamination chemicals, such as formaldehyde. Effective against a wide range of microorganisms and viruses, the MAL chamber is much more energy efficient and gentle on equipment. With a HPV generator, it can even be used on electronics such as laptops.

For an integrated generator please see pages 6 to 7.

Applications

Used to bio-decontaminate materials entering or exiting controlled environments, where validated cycles are required. These include goods entering a higher classification clean room in a pharmaceutical environment or goods exiting across the containment line in a **BSL3** or **BSL4** facility. The chamber can be installed into a preformed wall or into a cast concrete wall where it is forming part of the containment boundary.

Key Features

- Highly efficient transfer system
- Dedicated Siemens© PLC
- Cycle times as short as 40 minutes
- Validated Log6 cycles
- On-board compressed air supply available
- Plug and play spare parts for easy maintenance
- Selectable interlock priority for entry and exit on PLC
- Adjustable set points for maximum cycle temperatures protect temperature sensitive materials

HPV CHAMBERS SUPPLIED WITH:

- Project Specific Approval Drawing
- Installation of Unit
- Wiring of Chamber
- Commissioning of Chamber
- IQ-OQ
- Operator training
- Gas Cycle Development
- Performance Qualification
- 6 or 12 monthly servicing/calibration

Pneumatic Seal Door

Excellent containment control and functionality

Pneumatic seal doors provide the highest possible airtight containment in applications involving high traffic, wheeled equipment or large animals. The doorframe is flush with the floor eliminating the trip hazard inherent in mechanical seal doors.

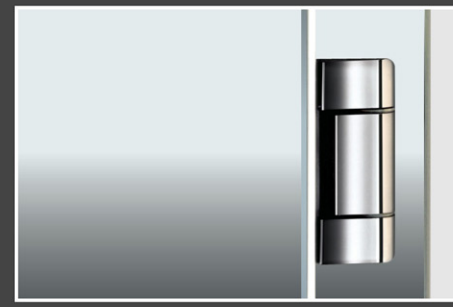
The seal around the perimeter of the door is inflated by compressed air against a wrap-around doorframe and provides excellent resistance to leakage up to pressure differences of 2000Pa (8" w.g.) and can be operated using an existing instrument-grade compressed air system.

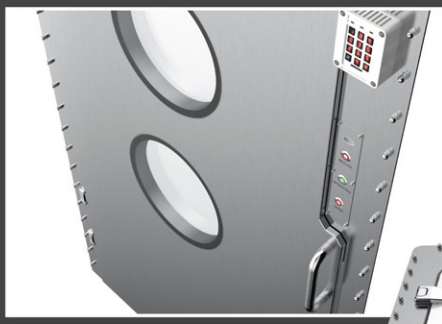
These doors are available in polished stainless steel, powder-coated low carbon steel, aluminum or solid core phenolic resin.

Applications

Pneumatic seal doors are used primarily in high containment and high traffic situations where air leakage cannot be permitted, such as bio-hazard laboratories (**BSL3, BSL4, BSL3-Ag** and **BSL4-Ag**), pharmaceutical laboratories and medical clean rooms.

The seal allows high containment during decontamination and fumigation processes in clean room facilities and laboratories. The frame can be supplied to seal into cast concrete walls, stud partition walls and block work walls.

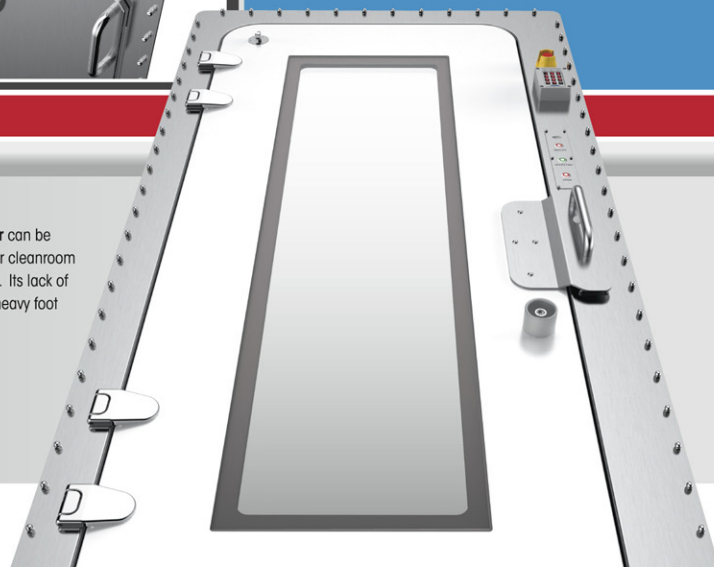




Key Features

- Highest level of airtight containment
- Flush threshold
- Solid core door leaf available
- Available in either single or double seal
- A range of access control and security systems are available

The **PBSC Inflatable Seal Door** can be configured for any laboratory or cleanroom between a **BSL2** and **BSL4-AG**. Its lack of a threshold makes it ideal for heavy foot and/or cart traffic.

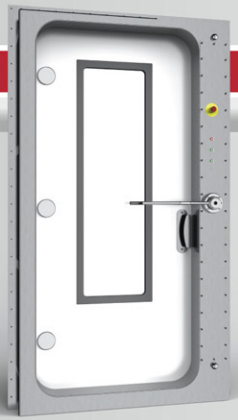


Mechanical Seal Doors

Highly Reliable Containment...

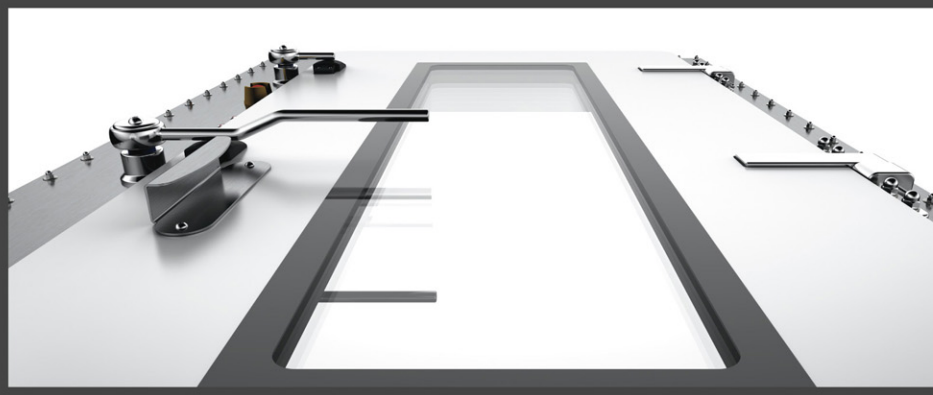
These high containment APR doors create a dependable airtight barrier by using a strong but flexible seal that is compressed against the doorframe. Manual compression of the seal doesn't require compressed air, thus providing a fail-safe seal in the event of a power failure.

An easy to use stainless steel arm is used to compress the door against the seal. The mechanical mechanism is mounted in the door frame, this keeps the weight of the door down and provides easier service that when mounted in the door leaf. The door has a raised threshold for the seal at the bottom of the door. If a flush threshold is required, please see the **PBSC** pneumatic seal door models.



Applications

Our range of mechanical seal doors are used in applications where high containment is required, such as in **BSL3** and **BSL4** labs. Due to the raised threshold inherent in these doors, they are most suitable in low traffic environments, and where wheeled carts are not necessary.



Key Features

- Simple, fail-safe design
- One-handed operation easily operates door
- Low maintenance
- Mechanism is mounted in the door frame for more robust design
- Solid core door leaf, with precision machining
- Flush glazing to both sides of the door leaf
- Custom access and control systems are available

Access Control

Various access control solution can be incorporated to suit specific building security requirements. These can be push pads, secondary monitoring systems, swipe cards etc...

Phenolic Resin Doors

Looks can be deceiving. These doors are strong and robust

Ideal for laboratory, cleanroom and corrosive environments, these doors are incredibly tough. Unlike metal doors, they will not dent, scratch or corrode, and most importantly, they have no hollow cavities where contamination can hide.

Meticulously engineered and manufactured with a solid core of chemical grade phenolic resin, these doors are impervious to most chemicals and cleaning agents. They will also improve the looks of your facility because they are available in a wide array of designer colours and incorporate the renowned **PBSC** stainless steel or powder coated wrap-around doorframe featuring clean, uninterrupted lines.

Applications

Attractive solid core phenolic resin door sets are primarily used in controlled environments, where impact, abrasion and chemical resistance are a necessity. This makes them an ideal choice where stainless steel doors may have previously been used. Multiple frame designs are available for installation in stud, block, or concrete walls.

Key Features

- Resistant to most corrosive chemicals
- Excellent impact resistance
- Solid core - no hollow cavities
- Full wrap-around frame
- Welded, polished frame construction with no rebate
- Flush-glazed vision panels in custom size and shapes

COLOR SWATCH OPTIONS

FLUSH LIGHT TIGHT WINDOW

Glass Doors

Transparent, functional, with a spacious atmosphere

Glass door sets incorporate the proven stainless steel or powder coated wrap-around door frame with its easy clean design. The combination of the 10mm thick tempered glass door leaf with smooth polished edges and the stainless steel frame will undoubtedly give a showpiece appearance in any facility whilst providing excellent functionality.

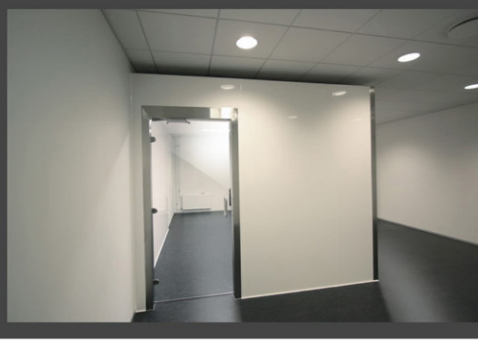
The frameless glass door system comprises of a frameless glass leaf with no hollow cavities that doesn't allow contamination to accumulate and is easy to clean. The 'open space' atmosphere created by the large glass area makes the frameless glass doors a favourite with operatives working within the confines of a laboratory room.

Applications

The frameless glass door is a popular choice in many laboratory applications, in particular those where ease of cleaning and reduction of hollow cavities for increased levels of contamination control are required. The glass door sets are widely used within facilities with frequent traffic, possessing high durability and excellent scratch resistance. The doors are ideally suited to environments where pressure differences are used, the gaps under the doors can be supplied to meet most pressure maintenance needs.

Solid stainless steel hinge
Purpose built for easy cleaning

Framless Glass Door



Key Features

- Frameless Tempered Glass Door Leaf (10mm thick)
- Full stainless steel or powder coated steel frame
- Purpose built solid stainless steel hinge to provide easy cleaning and opening up to 170°.
- Custom frame sizes to suit opening.
- Made to suit specific wall thicknesses
- Flush Maglock in frame
- Concealed closer system available for added hygiene

Flush mounted maglock

Concealed closure system
with solid stainless steel arm and closer rail

Transfer Hatches & Dunk Tank

MECHANICAL APR SEAL

Don't pass by our pass-through solutions…

Our range of room-to-room hatches provide reliable interlocked door transfer routes and are custom designed to address a wide range of applications; from non-containment environments right up to the most rigorously controlled **BSL4** laboratories. Wall-mounted versions are ideal for small hand-held items and our floor-mounted hatches are designed to handle larger items and carts.

Transfer Hatches are available in polished stainless steel, glass, phenolic resin or powder coated carbon steel, depending on the application. All models feature the reliable **PBSC** door interlock system and proven door hinge and seal system.

Also a range of Dunk Tank solutions are available with manual or PLC controlled transfer of goods.

Application

These hatches are used in a broad range of applications from pharmaceutical facilities **BSL2** through too **BSL4-Ag** biohazard laboratories. The hatches can be used in non high-containment situations where air purge or UV light treatment is desired. At the higher end of the containment spectrum, our hatches can be fitted with pneumatic seals and sophisticated access and control options. Hatches can be installed into preformed openings in cast concrete walls, block or stud walls. Fire-rated versions are also available.

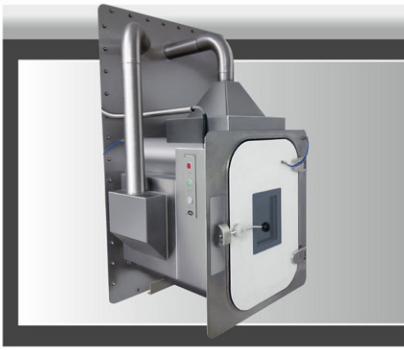
Dunk Tank

These are designed to allow material transfer via submersion in a chemical across the containment boundary. The design provides an excellent seal to the wall and the dunk tank provides secure containment and if the PLC if fixed to interlock the doors provides containment even when the dunk tank is empty as the fluid is not required for the air leakage resistance. Available with a range of options.

Where high level decontamination of materials is required please see the fumigation chambers on **pages 6-11**.

Key Features

- Highly reliable and easy to clean
- Custom sizes
- Pneumatic Seal and Mechanical Seal models
- Mechanical or electro-mechanical interlock
- Air purge and UV Lights available
- Range of control panels and security features



INFLATABLE APR SEAL

Where high level decontamination of materials is required please see the fumigation chambers on **pages 6-11**.

Airtight Windows & Lighting

Clearly better solutions...

PBSC offers a range of vision panels that provide excellent functionality and aesthetics throughout your facility. Our high containment vision panel is available double glazed or single glazed with a polished stainless steel frame. It is mechanically sealed to the wall with a compression gasket. We also offer window systems that use structural silicone for finishing to walls.

Our vision panels can be installed into cast concrete, concrete block or stud walls. Pressure test points are incorporated to enable fast and easy checking of the gasket seal.

PBSC Vision Panels can also be used in conjunction with our lighting fixtures to provide ingenious lighting solutions for controlled environments. The lighting fixtures are accessed from floor panels in the above floor - preventing the need for maintenance employees and equipment to be brought into the lab for routine maintenance.

PBSC vision panels and lighting systems are easy to clean and maintain, offering long-lasting solutions for your lighting and window needs.

Applications

Vision panels are essential in controlled environments from **BSL2** to **BSL4-Ag** to provide visibility and a friendly and functional open space atmosphere. Manually or electrically operated blinds can be fitted inside the vision panels where privacy is desired.

All vision panels and lighting systems come in standard and custom sizes and are appropriate for both retro fitting and new constructions.

Key Features

- Flush glazing (double glazed version)
- Easy to clean and maintain
- Simple pressure testing
- Double glazed to provide redundancy for sealing
- Security ballistic glass available
- Fire rated glass available

Our vision panels feature flush glazing on both sides resulting in a clean and aesthetically pleasing appearance and excellent functionality.

PBSC vision panels can easily be adapted to provide ceiling lighting fixtures that can be maintained from floor panels above.

Decontamination Showers

CHEMICAL SHOWER

We do our best thinking in the shower…

AIR SHOWER

Like our Decontamination Chambers, our Personnel showers are versatile, freestanding modular systems. The **PBSC** shower chamber can be fittedwith the right decontamination system for your facility. These include air showers, ultrasonic fogging showers, conventional spray nozzle shower and bio-decontamination chemical showers.

Along with our frameless glass doors both mechanical compression gasket seals and pneumatic seals are available. All showers are available instainless steel or powder coated steel construction.

Applications

Our showers cover the range of decontamination solutions to meet your specific application:

Air Shower

Provides a general de-dusting of PPE. It's ideal for removal of dander and potential particulate contamination prior to entry into a clean facility. It is less suitable for the removal of occupational exposure than our alternative showers.

Ultrasonic Fog Shower

A better alternative to conventional shower nozzles for encapsulating hazardous APIs. Due to the smaller water droplet size, fogging does not soak workers through Tyvek-type suits.

Adjustable
air nozzle

Stainless steel
surfaces with
no visible fixings

Breathing air point
for connection
to air suits

Ultra-sonic
fogging nozzles
fine mist saturation

Sloped
extract system
reduces moisture
build up

Fibre glass for
non-skid floor grid
for easy drainage

Key Features

- Modular design allows easy transportation to site
- Can accommodate multiple systems for maximum flexibility
- Easy to clean and maintain
- Interlocked doors
- Adjustable timers for the shower cycle.
- Air breathing point(s)
- Air shower with dedicated AHU and safe change housings

Conventional Spray Nozzle Shower

For personnel without PPE to shower IN or OUT of a facility with a thermostatically controlled hot water shower.

Testing & Training

Staying in control of controlled environments

Quality is guaranteed...

Quality Assurance is more than a department at **PBSC**, it is a daily strive for continual improvement in our range of products. Working with end users and consultants to ensure the product is meeting the quality and performance required. Our QA processes are independently audited and updated on a regular basis.

Routine product testing at **PBSC** ranges from long duration decay testing to full controls functionality testing. Over the years we have conducted many tests and prototypes covering all aspects of our product offering.

PBSC continues to meet the growing challenges of bio-safety and bio-security in laboratories and clean rooms, from enhancing bio-containment in government **BSL4** virology labs to protecting the clean environments of a pharmaceutical, hospital and electronics manufacturing facilities.

The PBSC Testing and Training

Safety and verification have always been important values at PBSC. We handle a lot of testing in-house. Our testing facility increases the reliability and durability of our products and provides important first-hand demonstrations and evaluations for both our engineers and customers.

For example, the pneumatic seals used in our APR doors undergo rigorous testing and inspections from the initial compounding stage to the final fit-up, and all of our critical structural and leak path welds are inspected. Providing confidence the product will perform as expected after installation.

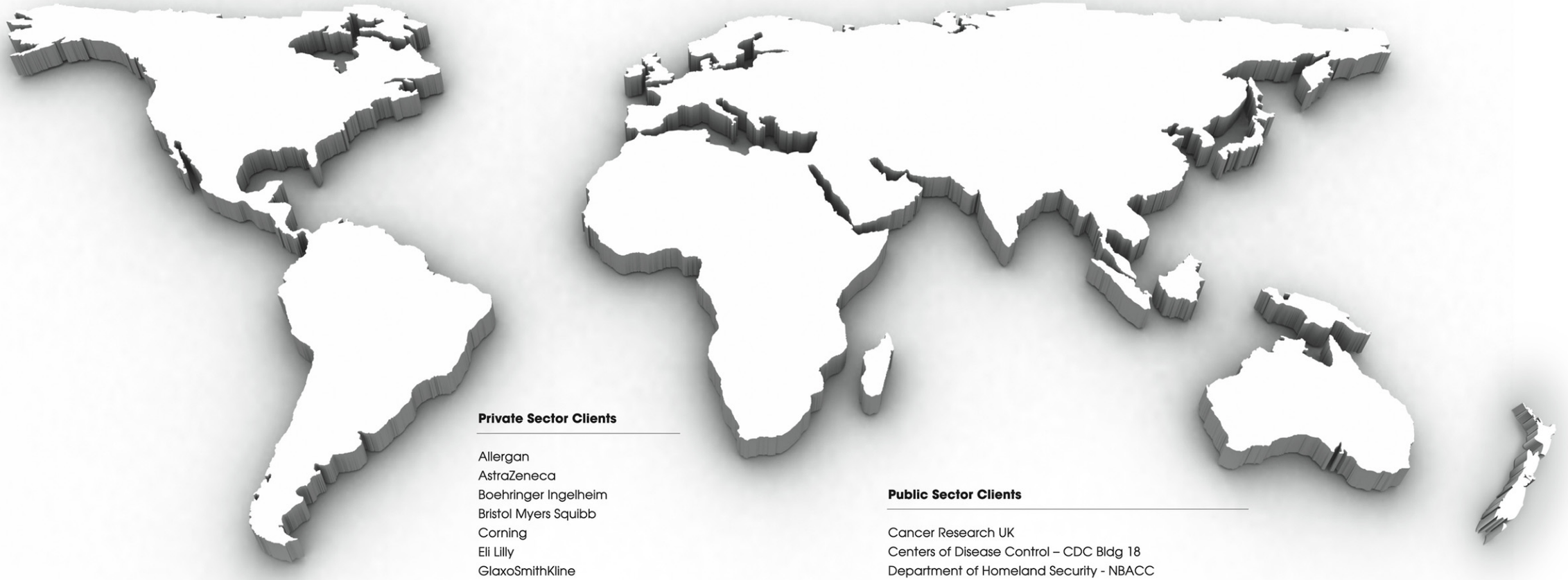
Over the years, as our products grew more complex, and increasingly incorporated electronics, there was a growing need to offer end-user training. To answer this need we keep many functional products in our factory and encourage customers to learn about our products first hand from our engineers and technicians.

Having your maintenance technicians properly trained will save you time and money. Improving you knowledge of preventative maintenance along with common issues and best practices for specific industry applications will help you keep your controlled environment running smoothly and safely. - We encourage you to take advantage of our training facility.

PBSC TTC Resources Include:

- Testing
- Training
- Demonstration
- Evaluation
- Validation

CRITICAL CONTAINMENT SOLUTIONS



IN CORPORATION WITH **PRESRAY**

The following are some of the companies and organisations that have used **PBSC / Presray** for their critical containment solutions:

Private Sector Clients

Allergan
AstraZeneca
Boehringer Ingelheim
Bristol Myers Squibb
Corning
Eli Lilly
GlaxoSmithKline
Hoffmann-La Roche
Intel
Intervet (Merck Animal Health)
Johnson & Johnson
Lonza
Merck
Novo Nordisk
Novartis
Pfizer
sanofi–aventis
Schering Plough
3M Healthcare
Wyeth

Public Sector Clients

Cancer Research UK
Centers of Disease Control – CDC Bldg 18
Department of Homeland Security - NBACC
Health Protection Agency (UK)
NHS Hospitals (UK)
Parvill Neurosciences Development Project (PNP) (Australia)
PUMC Medical and Pharmaceutical Corp (China)
Singapore Govt. (Singapore)
Staten Serum Institute (Denmark)
Southwest Foundation for Biomedical Research
The Institute of Animal Health – Pirbright (UK)
United States Army – USAMRIID
USDA — Ames Iowa
USDA — Plum Island
Walter Reed National Military Medical Center
National Institutes of Health – NIAID IRF

University Clients

Baylor College of Medicine
Dublin City University (Ireland)
Kansas State University
Nottingham University (UK)
Sabah University (Malaysia)
University of Georgia
University of Wisconsin

PBSC LTD
Bradley Junction Industrial Est. Leeds Road, Huddersfield,
West Yorkshire, UK. HD2 1UR

Other items supplied by **PBSC**: DUNK TANKS | VISION PANELS | BOOT RACKS | TRANSFER HATCHES | EMERGENCY ESCAPE PANELS
PBSC are also happy to talk about engineering solutions and manufacturing bespoke components.

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