bioGO®
40’ ISO Container BSL-3 Laboratory Building
Product Specifications

Overview

Germfree’s bioGO® Laboratory Buildings offer a new approach to rapidly bringing high-quality and cost-effective laboratory capacity to any region of the world. These offsite built, containment ready facilities meet the World Health Organization (WHO) guidelines for BSL-3 laboratories. Germfree labs contain spacious interiors that are engineered to provide an ergonomic and effective work environment. By utilizing an ISO container platform, this fully equipped Biocontainment Laboratory can be deployed globally. These turnkey units are pre-commissioned and tested to ensure compliance upon delivery to site. Germfree facilitates all aspects of the project — delivered, installed and made operational in a truncated timeline.

Germfree - Proven track record in deploying advanced laboratory capacity globally

Germfree has been manufacturing innovative laboratory solutions for nearly six decades. Our mobile and modular biocontainment units deliver critical laboratory capacity in the US and throughout the world.

Germfree is the only manufacturer that provides a single-source, OEM solution for both the laboratory and all critical containment equipment. Our leading-edge engineering teams and subject-matter experts are located at our 173,000ft^2 US manufacturing plant. Germfree’s turnkey mobile and modular units meet the most stringent biocontainment requirements and provide critical infrastructure for global health security.

General Specifications

High-Cube Shipping Container
- External Dimensions:
  - 40ft (12.2m) L x 8ft (2.43m) W x 9.5ft (2.9m) H

Main Entry Area
- Internal Dimensions:
  - 74” (1.88m) L x 90$^{7/8}$” (2.31m) W x 95$^{7/8}$” (2.44m) H

Anteroom
- Internal Dimensions:
  - 69$^{7/8}$” (1.78m) L x 90$^{7/8}$” (2.31m) W x 95$^{7/8}$” (2.44m) H

WHO BSL-3 Laboratory
- Internal Dimensions:
  - 318$^{3/4}$” (8.01m) L x 90$^{7/8}$” (2.31m) W x 95$^{7/8}$” (2.44m) H

Interior Materials

Walls and Ceiling
- Seamless wall system
- Panels come in 40 foot lengths to eliminate wall seams
- Corners permanently sealed with an epoxy compound specifically designed for this purpose
- The end result is a monolithic barrier that is durable and easily cleaned

Flooring
- Finished floor will be a high performance, homogenous, welded seam sheet polyurethane floor

Casework
- Type 304 Stainless Steel work casework
- Purpose built, all welded construction with adjustable shelving

Application

Germfree’s ISO Container Laboratory Buildings fill a critical void in global public health as many regions lack suitable and sustainable lab capacity. Traditional laboratory design and construction projects can be costly and time-consuming, relying on multiple subcontractors and requiring intense coordination. Further, many projects are not adequately built to the required level of performance or do not remain operational over the long term. A key challenge is to install labs that are feasible for any region and will remain viable for decades. Germfree’s Laboratory Buildings are part of a comprehensive solution for building permanent international biocontainment laboratory infrastructure.

Applications include:

- Emergency Disease Surveillance
- Temporary Laboratory Space during facility down time
- Laboratory Swing Space
- Any application where microbiological containment laboratory space is required

bioGO Laboratories are designed to be powered from shore power and are equipped with an automatic transfer switch for integration to locally available generators to provide redundancy in case of power outages or fluctuations.

Features

Advanced Design and Engineering
bioGO Laboratory Buildings comply with the World Health Organization (WHO) Laboratory Biosafety Manual - Third Edition guidelines for BSL-3 laboratories as well as the NIH CDC Biosafety in Microbiological and Biomedical Laboratories (BMBL) 5th edition guidelines. Standard enhancements such as an anteroom, directional airflow, and HEPA filtered exhaust air provide added safety for the operators and the environment.

Flexibility of Operations
Our WHO BSL-3 Laboratory Buildings are designed by a team of biocontainment experts to provide the optimal

Class II, Type A2 Biological Safety Cabinet inside the Laboratory

safety for the handling of biologically contaminated materials. This allows the facility to be effectively utilized for manipulating samples required to be handled in a containment laboratory environment.

Efficient Workflow
Germfree’s bioGO WHO BSL-3 Laboratory Buildings are engineered and equipped for the most efficient workflow. The facility is divided into designated work zones. Each zone contains the primary containment equipment required for a safe sample flow throughout the laboratory process. Additionally, we strategically place stainless steel workstations, storage and supply areas, gowning benches, and staging tables.

Enhanced Ergonomics
A sample transfer airlock, centrally located in the anteroom, allows for samples to be processed into the laboratory while maintaining robust Chain of Custody Procedures.

Layout

Germfree’s bioGO BSL-3 Laboratory Buildings are designed with 3 Distinct Work Zones:

Main Entry Room
The Main Entry Room contains lockers for storage. The main entrance door is equipped with the proper access security for your application. The main electrical distribution panel and/or sub-panel is also located in this room.

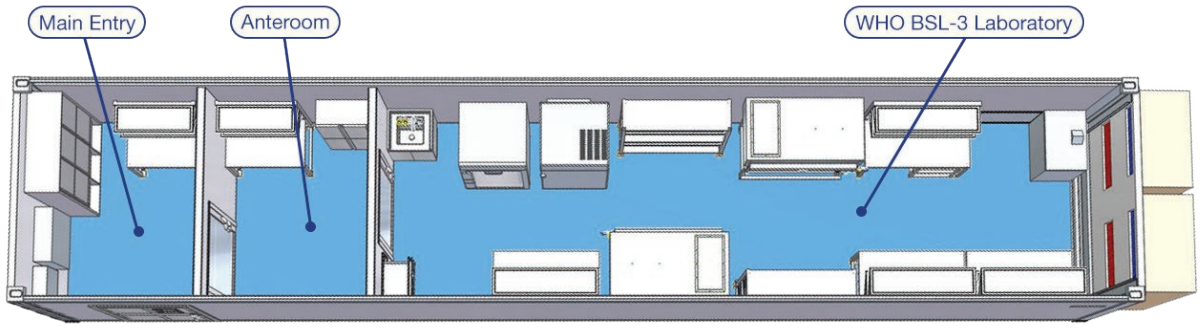
Anteroom
This room serves as an air break to the laboratory exterior and as a space for personnel to don their Personal Protective Equipment (PPE). The area is equipped with shelves and lockers for storing PPE. The anteroom is maintained at positive pressure relative to the Main Entry to provide an additional barrier to the air cascading into the BSL-3 laboratory. Pressure gauges at each door display room pressures, and have alarms to indicate unsafe conditions due to changes in the differential pressures between the rooms. All interior doors can be operated hands-free. Interlocks prevent both anteroom doors from being open simultaneously.

WHO BSL-3 Laboratory
This WHO BSL-3 Laboratory area exceeds BMBL 5th edition laboratory facility guidelines as the room air is externally exhausted through HEPA filters. The room is equipped with Class II, Type A2 Biological Safety Cabinets to protect the product and personnel. A top-loading autoclave is provided for sterilization.

Ample storage space is provided by the custom casework as well as an integrated refrigerator and freezer. All casework is stainless steel with seamless welds, coved corners and radiused edges and is compatible with all standard gas and vapor decontamination systems.

Mechanical Specifications

A heating, ventilation and air conditioning (HVAC) system is installed in the bioGO facility. The HVAC system is engineered to maintain a comfortable working temperature and humidity, and provides an inward flow of air into the WHO BSL-3 laboratory. The mechanical ventilation also prevents recirculation to spaces outside of the laboratory.



Electrical Specifications

Connections for utility power and/or auxiliary generator inputs are provided via transfer switch. Diesel electric generator packages are optionally available and can be supplied by local equipment rental companies.

Electrical requirements will vary be region. Germfree will configure the laboratory power to meet any international standard.

Shore Power Requirements:

110-230V, 50/60Hz, 3Ph, 80A
- Single point connection
- Shore power inputs are providedd

Plumbing Specifications

- One (1) Stainless Steel Sink
  - Includes emergency eyewash
    - Compatibility for connection to a water utility tap
  - 2.4 kW on-demand electric water pump
  - PEX supply and CPVC drain lines
  - Single Point of connection

Controls, Communications & Recording Systems

Communication Ports
(12) Data ports are provided for network instruments, computer workstations and printers. Cables are run in shielded chases to a patch panel in the anteroom. Telephone port is provided in the Main Entry.

Also included are:

- Intercom System
- Fire / Burglar System
- BMS - Environmental Monitoring

Cameras and Monitors
Digital video cameras and a digital video recorder (DVR) provide perimeter security. Interior and exterior cameras provide live local video.

- CCTV system (8 cameras, DVR capable of recording 30 days of video)

Data / Phone Network
- All data terminated into a patch panel in the command center

Construction Specifications

Germfree’s biocontainment laboratories are designed to be exceptionally durable. To achieve this, only the highest grade, cleanroom-compatible materials are used in the facility’s construction.

The interior walls are constructed of an exclusive high performance composite that provides a seamless interior suitable for frequent wash-downs with sanitizing agents as well as gas bio-decontamination.

The floor is seamless vinyl, coved up the walls, and epoxy-sealed to the walls for ease-of-cleaning.

All work surfaces are seamless stainless steel with casework designed for gas and vapor phase decontamination. Surfaces are coved for easy spill cleanup and sanitization. Edges are rounded and polished to avoid snagging Personal Protective Equipment (PPE).

- Computer and printer provided by end user
- Data rack can support customer supplied switch
- Cables in shielded chases
- Telephone port will be provided in the Laboratory Command Center
- Keyless entry main door

Testing & Quality Control

Germfree’s bioGO Quality Process is designed to evaluate performance as well as fit and finish of every system on our modular platform. Evaluation and testing is conducted on all components and aspects of the facility.

Germfree’s Quality Control Team employs a checklist-based system during a rigorous trial period. All systems are thoroughly vetted and documented in real world conditions before the bioGO is allowed to leave our manufacturing facility.

Germfree’s commitment is to provide a complete, stand-alone facility with zero defects, ready and installed with complete confidence at our customer’s site.

Installation

Prior to delivery of the bioGO Laboratory Building, Germfree’s service department will work with you to determine what site work needs to be completed before installation can occur.

Pre-installation Consultation can include:

- Overall Location of the unit and the surroundings
- Power supply
- Data cables and integration
- Fresh/waste water connections
- Laboratory exhaust discharge assessment
- Location grade assessment
- Accessibility

Options:

☐ Germfree site visit for installation consultation

Germfree technician/s will be on-site after delivery to assist with installation, setup, and to provide training on the startup and daily operation of the facility.

Cleaning & Bio-decontamination

Optional Service:

☐ bioGO Mobile Facilities receive a thorough construction cleaning before they are deployed. Germfree has validated a bio-decontamination process that can be performed on location via vaporized / ionized hydrogen peroxide (VHP/IHP).

Documentation

Each BSL-3 Laboratory Building is delivered with a full set of as-built drawings and a factory acceptance test summary. Additional documentation, if necessary, can be requested from your project manager.

Commissioning and Qualification (C&Q)

Commissioning and qualification is performed consistent with current industry best practices.

A Commissioning & Qualification Master Plan (CQMP) is utilized to define the requirements and methodologies for the commissioning & qualification (C&Q) of the facility, utilities, systems, and automation within the scope of the build and qualification phase.

The overall C&Q approach will utilize industry standard risk-based methodology and leveraging activities. This plan will describe a systematic, efficient, and effective way of ensuring that systems and equipment function and operate according to intended use, without duplication of effort and testing.

Commissioning includes Factory Acceptance Testing (FAT), Site Acceptance Testing (SAT), Construction Q/A and Commissioning Test Plans. The Verification is the performance and documented evidence of testing completed within the commissioning process.

Qualification will be conducted for all direct impact system in scope.

Standards & Codes

Germfree’s bioGO Laboratory Buildings meet or exceed the requirements of the World Health Organization (WHO) Laboratory Biosafety Manual - Third Edition guidelines for BSL-3 laboratories as well as the NIH CDC Biosafety in Microbiological and Biomedical Laboratories (BMBL) 5th edition guidelines.

Project Management

A dedicated project manager will oversee all aspects of your laboratory purchase from order through delivery. In so doing, it is possible to guarantee a seamless transition into your bioGO Biocontainment Laboratory.

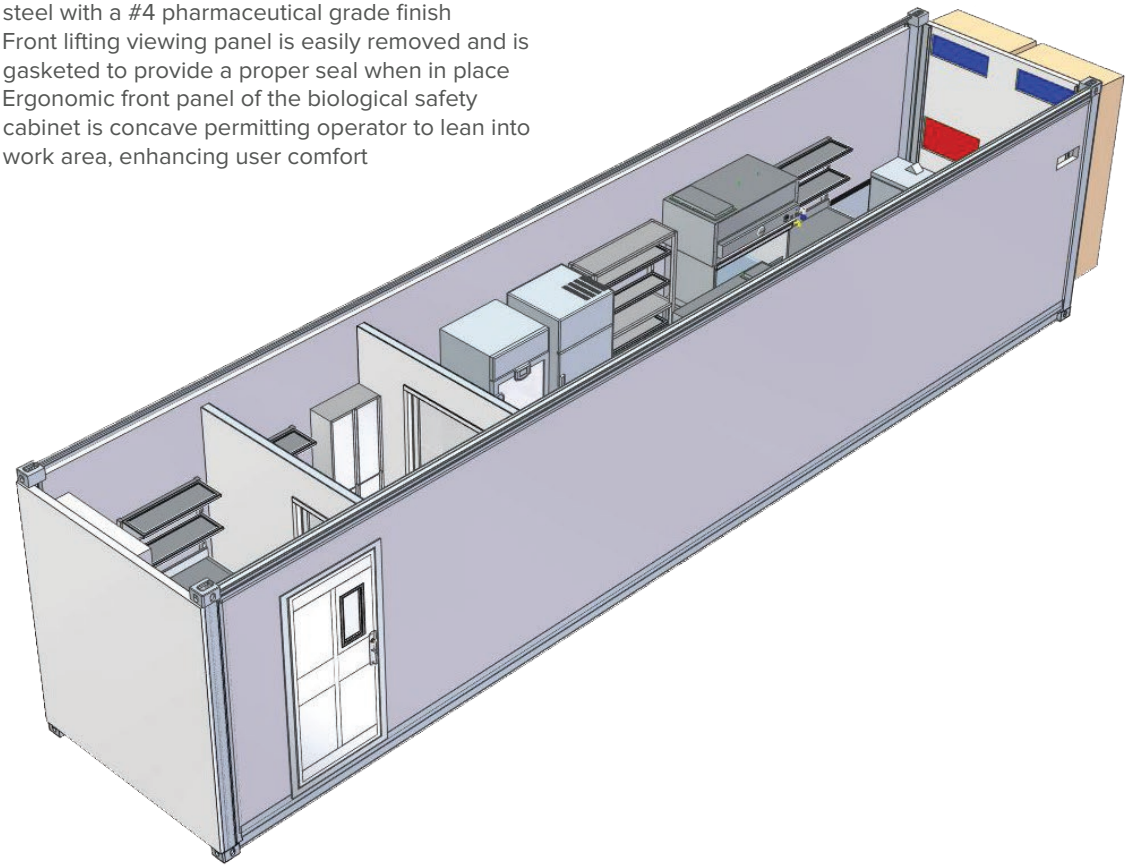
Equipment

Germfree’s bioGO Laboratory Buildings are delivered fully-equipped and ready for on-site commissioning. The standard configuration consists of:

Main Entry
- Stainless steel countertops with seamless welds, coved corners and radiused edges
- Stainless steel casework
- Lockers and shoe storage

Anteroom
- Material pass box connecting the Anteroom and the BSL-3 Laboratory
  - Allows the transfer of materials from the BSL-3 laboratory into the Anteroom or vice-versa while maintaining containment
  - Interlocked doors assure that the airlock is never open on both sides simultaneously
- Shelves / Lockers for storing PPE

WHO BSL-3 Laboratory
- Two (2) Class II Type A Biosafety Cabinets
  - Model BBF-4SSRX
  - Outer cabinet and work surface are welded stainless steel with a #4 pharmaceutical grade finish
  - Front lifting viewing panel is easily removed and is gasketed to provide a proper seal when in place
  - Ergonomic front panel of the biological safety cabinet is concave permitting operator to lean into work area, enhancing user comfort
  - High capacity motor/blower system with speed control to extend the life of the HEPA filter
  - Supply and exhaust HEPA filters are parallel to work area and each other to prevent turbulence
  - Removable stainless steel work tray and tray supports facilitate easy clean up of the biological safety cabinet
  - Separate lighted power ON/OFF indicator switches for blower and lighting
  - Electrical inside Laboratory:
    - 115V, 60Hz or
    - 220V, 50 or 60Hz
  - Ten foot power cord with molded grounded plug
  - Constructed to allow for optional outside venting of exhaust air from the biosafety cabinet
- Custom casework provides ample storage space
- Stainless steel hand washing sink
- Standard laboratory refrigerator
- Standard laboratory freezer
- Top-loading autoclave
- The preparation areas consist of stainless steel countertops with seamless welds, coved corners and radiused edges



Quality Statement

Accountability
We will deliver our products on time, as promised, and free from defects.

Ownership
We will strive to exceed expectations at every level and we will work to make sure that each customer is satisfied with the service that they receive.

Longevity
All of our products are constructed from the highest quality materials and are designed to operate reliably for decades. We stand behind our work and take pride in our superior craftsmanship.

Our Company

Germfree has been a leading innovator in aseptic control and isolation systems since 1962.

We design and manufacture a diverse range of equipment and facilities for life science applications.

Our systems are integral to critical processes across many sectors. We specialize in complex projects and custom applications that serve the rigorous demands of our clients. Our high-specification bioGO Modular Facilities operate across the world, and are sustainable as permanent facilities in remote regions with harsh conditions.

Germfree’s Mission:

Creating Environments that Serve Life Science Innovation and Advance Global Health

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