

Getinge GEB Series Biosafety Sterilizers

Safe, reliable decontamination in biocontainment facilities



 GETINGE

VICPAS
HMI Parts Center

A new sense of reality

In light of the biohazards we live with today, and may be faced with in the future, the bio-containment community is responding with a new sense of urgency to prepare for these emerging threats.

Biocontainment laboratory facilities once considered state of the art are being reconfigured and upgraded to reflect the new reality of bio-terrorism. Until now, there has been an absence of accepted standards governing sterilizers used in a bio-containment environment, despite the need for them.

That's why Getinge is collaborating with laboratory designers, architects and bio-containment specialists to determine industry wide guidelines for sterilizer design and installation.

Getinge is dedicated to providing bio-containment sterilizer systems that minimize risk associated with existing bio-safety facilities, while establishing a new benchmark of sterilization and containment for laboratories that have yet to be built.

Why Getinge?

Getinge is a leading global medical technology group that provides complete infection control solutions to hospitals, laboratories and pharmaceutical companies around the world. The Getinge Group is the world market leader in this field, with sales and service support channels in more than 100 countries on all 5 continents.

Extensive knowledge of processes and applications, built up over the last 70 years, have made Getinge the world leader in the field of decontamination and sterilization. This knowledge is made available to our customers in the form of features built into a comprehensive range of equipment. We also share our expertise with architects, engineers, microbiologists, laboratory personnel and equipment operators to enable them to optimize the use of Getinge systems for maximum safety and efficiency.



A dedicated yet versatile range

Like all laboratories and research facilities, bio-containment suites need autoclaves for sterilization of media and equipment and decontamination of waste material. The pathogenic nature of the waste material from such facilities coupled with the use of the autoclave as a barrier between the facility and the outside world places special requirements on the autoclave design and processes used: standard autoclaves cannot fulfill these criteria.

The Getinge GEB Series is a standardised range of dedicated autoclaves, specifically designed for use in BSL 3 and 4 facilities.

A wide variety of chamber sizes are available, ranging from 0.3 to 17 cu.m and all models are available with one or two doors as appropriate for use in the facility.

The GEB range is available with a range of flexible process combinations to suit the type of facility, for example:

- **Microbiology laboratory (incl. Biosafety facilities)**
Glassware, culture media, hazardous waste
- **Animal care facility / vivarium**
Cages, racks, bedding, pathogenic waste

Please refer to individual product specifications for additional details.

Unique features of the GEB range include:

- Validated biological sealing flange (bioseal). Creates a hermetic seal between hot and cold zones. Third party certified design.
- Hermetically sealed conduits (condulets) through the bioseal for all electrical cabling into the hot zone.
- Membrane filtration on all pneumatic signal lines passing through the bioseal.
- Isolating valves and chemical decontaminant injection ports in the process system - for decontamination of piping system prior to maintenance activities.
- Getinge's unique effluent sterilization process. Safe and effective air removal for sterilization efficacy and condensate retention and sterilization.

SMALL GEB STEAM STERILIZERS



600 Series. Fully automatic high-pressure steam sterilizers with a single vertical sliding door, or two vertical sliding doors for pass-through operation.

Standard chamber volume:
10 to 26ft³ (0.3 to 0.8 m³)

MEDIUM-SIZE GEB STEAM STERILIZERS



900 Series. Similar to the small sterilizers but with larger chamber sizes and automatic horizontal sliding door(s).

Standard chamber volume:
21 to 36ft³ (0.6 to 1.1 m³)



LARGE / BULK GEB STEAM STERILIZERS



1400 and 2200 Series. Sterilizers with automatic horizontal sliding door(s) for large-scale applications. They can be pit-mounted for convenient floor loading.

Standard chamber volume:
47 to 590ft³ (1.4 to 17 m³)

Features that set the industry standards

The GEB Series sterilizers set the industry standard for a new generation of autoclaves designed specifically in response to the need for new, modern biocontainment facilities; to define a new 'state-of-the-art'.

DOOR SEALING MECHANISM

Choose from Getinge's traditional active door gasket or the revolutionary 'Slideloc'™ passive system. The active gasket is mechanically simple and inherently reliable while Getinge's Slideloc System* does not rely on utilities to maintain the seal between chamber and door.

BIOSEAL CONNECTIONS

Sealed conduits are provided through the bioseal for electrical connections (with 100% redundancy).* All pneumatic lines are provided with membrane filters.

SPECIALISED WASTE PROCESSING

Processes are purpose designed for effective decontamination, including treatment of plastic waste material in disposal bags and part sealed containers.

This specialised process prevents fusion of the plastic materials and entrapment of air which would otherwise prevent steam penetration.



DIAPHRAGM ISOLATED INSTRUMENTATION

Pressure transducers and gauges are isolated from the chamber by sanitary diaphragms. This eliminates capillary piping which accumulates stagnant water in the process system (where microorganisms may multiply). The safety valve is similarly isolated by rupture disk.

BIOLOGICAL SEALING FLANGE (BIOSEAL)

Typically a double door chamber forms a barrier between the hot and cold zones. As such the chamber must be hermetically sealed to the wall. Traditional flanges cannot guarantee an airtight seal due to thermal stresses and incompatible materials. Getinge's Bioseal combines bolted stainless steel panels, a rubber gasket* and a wall flange that is installed in the building fabric. The design is independently validated and certified.

ISOLATING VALVES & INJECTION PORTS

The process and drain piping system is provided with isolating valves and chemical (typ. formaldehyde) injection ports to allow safe maintenance and filter changing.

NOTE: The GEB Series is based on Getinge's GE Series. Most features, options and process combinations of the GE Series are also available for the GEB Series. See GE Series brochure and product specifications for details.

GEB Series - typical models ^{***}	6610	6910	91415	102222	182222
CHAMBER VOLUME ft ³ /m ³	16 / 0.45	29 / 0.83	71 / 2.01	170 / 4.8	308 / 8.70
CHAMBER WIDTH, in/mm	26 / 672	26 / 672	35 / 900	39 / 1000	71 / 1800
CHAMBER HEIGHT, in/mm	26 / 672	36 / 920	57 / 1450	86 / 2200	86 / 2200
CHAMBER DEPTH, in/mm	39 / 1000	53 / 1350	60 / 1540	86 / 2200	86 / 2200

* See over page

*** Typical only. Many models available in each series.

Sterilization efficacy versus containment

Containment presents several challenges to the sterilization system designer:

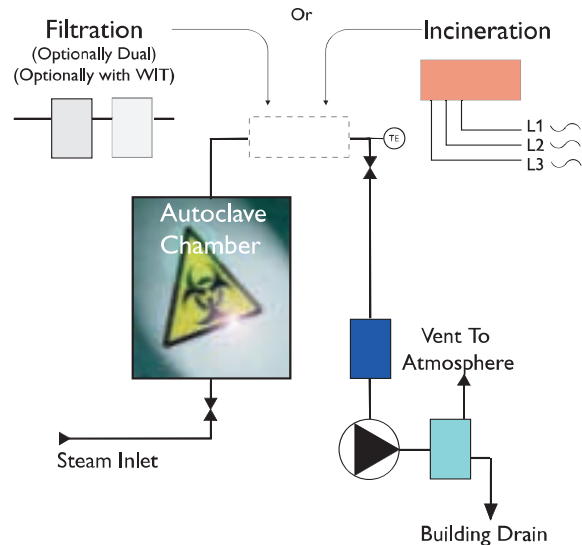
An established principle of steam sterilization demands air removal prior to steam injection.

Challenge: air in contact with materials in the chamber is contaminated and cannot be removed without treatment.

A physical principle is that steam condenses when it comes in contact with cooler surfaces.

Challenge: the condensate produced as steam heats the contaminated materials, prior to achieving sterilization conditions, is itself contaminated. It requires treatment prior to release to the building drain.

Several options are available to treat the removed air and condensate, and should be applied based on a risk assessment of the facility design. The options are summarised below.



OPTION 1

Use a standard autoclave process, direct all effluent to drain (with use of kill tank for BSL4 applications). This approach has been used historically, but is not recommended for modern facilities. Systems using an ejector for air removal rather than a mechanical pump should be avoided as the process is inefficient.

OPTION 2

Filter the air evacuated from the chamber through a 0.22µm sterile membrane filter. This renders the air sterile and the filter is steam sterilized during the subsequent process. For added security, a second filter may be installed in series.

Additionally, an automatic in-place WIT integrity test may be performed on the filtration system.

Condensate produced is collected in the chamber base and is heated by incoming steam and by the steam heated external jacket. Sterilization of the condensate is confirmed by temperature sensors.

OPTION 3

Pass the air through the unique Getinge incineration system. This validated ultra high temperature device provides a torturous pathway for the evacuated air. This destroys all viable organisms, rendering the exhaust air sterile and safe to discharge.

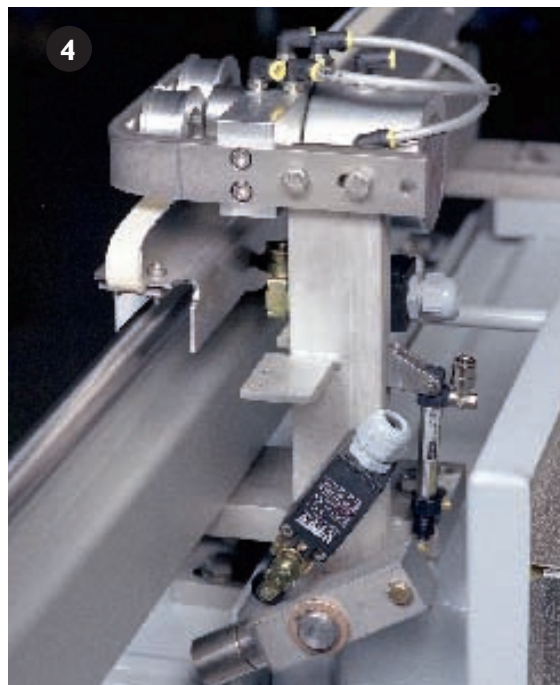
Condensate is treated as described for Option 2.



Optional dual sterile membrane filters arranged in series with optional in-place automatic WIT integrity testing.



Optional unique in-line incinerator deactivates bacteria and spores as they are evacuated from the chamber.



SAFEGUARDING YOUR INVESTMENT

CORE FEATURES OF THE GEB SERIES

1. The unique sectional jacket adds strength and rigidity to the chamber, and robotic welding eliminates defects. The resulting construction ensures a long product lifecycle to safeguard your facility and investment
2. The independently validated Bioseal flange creates a hermetic seal between zones. Fabricated from a combination of bolted steel panels and a rubber gasket. The mating wall flange is provided to the client during construction for installation in the building fabric.
3. Electrical signals to the hot zone pass through sealed conduits (condulets). Similarly pneumatic signals pass through membrane filters.
4. The doors of Getinge sterilizers are the cleanest, safest and simplest on the market.
5. Getinge's unique "Slidoloc™" passive door locking system. Provides a compression seal of the door gasket when the door is in the closed position. Does not rely on services to maintain the seal.
6. Top-quality piping and components are assembled to the highest standards.

Control systems

As standard, the GEB Series utilizes Getinge's renowned PACS 3000 Control System. This dedicated controller is used on thousands of sterilization and washing systems worldwide and is purpose designed for the application. PACS 3000 accurately handles tasks such as parameter setting, control operations, system programming and data processing, presentation and storage.

Versatile features

The major features included in PACS 3000 are:

- A user-friendly interface
- Extensive documentation
- Remaining cycle-time indicator
- Automatic sensor calibration
- Comprehensive alarms/alerts
- Process and alarm logging
- Multilevel password protection
- Multilanguage display
- PACS Supervisor independent monitoring option

Standard PLC Systems

The PACS 3000 is specifically designed to control process equipment for applications in the Life Sciences. Many thousands of PACS systems are in operation around the world. However, if a customer prefers, standard PLC systems are available based on Allen-Bradley platforms.

These PLCs are provided as standard options with similar functionality and documentation to the Getinge PACS 3000.



OP30 USER INTERFACE

- Door open/close buttons. Status LEDs.
- 5.7" color screen for process info:
 - Remaining time, cycle & phase, temperature(s)
- Graphical process presentation:
 - Plot graph, bar graph
- Parameter settings.
- Maintenance & service menus.
- System configuration.

PROCESS DOCUMENTATION

NETWORK SOLUTIONS

- Ethernet
- Industry standard protocols
- Remote support facility
- CS 1000

Other equipment and services from Getinge

In addition to the GEB Series, Getinge supplies a wide range of other equipment for a wide range applications in Research or Microbiology laboratories.

Whatever the application in the Life Sciences, Getinge has the solution for all your washing and sterilization applications. Consult Getinge for further information. www.getinge.com / info@getinge.com



Getinge GEW Series Washer-Disinfectors are ideal for larger items such as animal cages and racks.



Typical small Getinge laboratory glassware Washer / Dryer.



GETINGE provides a unique range of products that fit together with coherent design and functionality. We also offer expert advice, analysis of requirements, interior design support, system installation, after-sales service and training.

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