



Laboratory & Scientific Line

Bulk Steam Autoclaves

Bulk Steam Autoclaves for Life Sciences

The bulk autoclave line is designed for the sterilization of laboratory products and instruments including cages, racks, glassware and bedding used in the animal care market. The autoclaves have pre and post vacuum capabilities. A wide range of sizes and upgrades are available to meet the ever-growing demands of today's research facilities. The autoclave is manufactured using reliable, high grade, sanitary non-proprietary components.





A Flexible Range of Models

Tuttnauer offers a variety of floor or pit mounted autoclaves built to high standards to meet your needs.

Floor Mounted

Model	Chamber Dimensions (cm) (W x H x D)	Volume (Liter)
364853	91 x 122 x 135	1500
364860	92 x 122 x 151	1700
364872	92 x 122 x 182	2000
3648144	92 x 122 x 363	4000

Pit Mounted

Model	Chamber Dimensions (cm) (W x H x D)	Volume (Liter)
366260	91 x 157 x 152	2260
358686	90 x 220 x 236	4370
428686	107 x 220 x 218.5	5890
498686	125 x 220 x 236	6490
728686	183 x 220 x 219.5	9500



Chamber

The chamber is constructed from durable AISI 316L grade stainless steel material. The bulk autoclave models have fully jacketed chambers ranging in volume from 2000 to 8720 liters. Chambers can also be custom built to suit specific end-user requirements. The inner chamber wall surface has a shiny polished finish with an Ra value $\leq 0,8\mu\text{m}$. The bulk autoclaves are designed to accommodate any load that has to be sterilized. Small items may be placed on specially designed trolleys and racks.

Door

Each model is available in either single or double door configuration. The doors are automatic horizontal sliding doors and are operated

by a pneumatic door mechanism. The door is constructed from AISI 316L grade stainless steel that provides maximum reliability and minimum maintenance. The door closure is secured by means of a high grade silicon profile that is forced against the door by compressed air.

Door Safety

All doors are designed with a number of safety features:

- No door will open if there is still pressure in the chamber
- No door will open if the chamber or load temperature is too high
- In a double door system it is impossible to open two doors simultaneously
- During door closing, the door will open immediately if an object is detected in front of it

Advanced Sterilization Cycles for Diverse Load Types

The autoclave is provided with up to 20 programs to handle a wide range of load types:

- Cages, bedding and feed
- Liquids, non-porous goods, porous loads and media in closed vented glass
- Two test cycles: Bowie & Dick and Vacuum Leak test

All programs are fully customizable to suit the specific needs and requirements of the end user.

Prevacuum Cycle

The prevacuum cycle is fast and effective to remove air from the chamber and load, ensuring good steam penetration. The vacuum system uses either a water ring vacuum pump or an ejector to extract air from the chamber.

Gravity Cycle

Non-porous goods, liquids and media in closed vented glass containers are suitable to be sterilized by a gravity cycle. The gravity cycle uses the gravity displacement air removal principle.

F₀ Cycle

F₀ control enables reduced media exposure to high temperatures thereby reducing cycle time and preventing damage to temperature sensitive media. The exposure time measure is calculated using algorithm based software from the time the temperature sensor in the load has reached a predetermined set point until the end of the sterilization stage.

Streaming Steam Cycle (105°C)

Low temperature sanitation cycle set at 105°C. This cycle is generally used for melting agar in laboratory environments. Steam is allowed to enter the chamber and the fast exhaust valve is opened to allow steam to flow over the contents of the unit.

Bio-Hazard Cycle

Tuttnauer autoclaves can be customized to meet the specific requirements of laboratories classified as BSL3/4 where harmful pathogens and viruses that leave the autoclave prior to disposal must be fully sterilized. The thermal effluent sterilization cycle will sterilize chamber air and waste water prior to their release into the drain.

As an alternative we offer an absolute filter in the air removal system. The filter is sterilized during the process and the condensate remains in the chamber and is released after full sterilization.



Bio-Shield

Bio-Shield Frame Option

The Tuttnauer bio-shield frame meets the BSL2 bio-safety level. The autoclave is surrounded by a frame that serves as a placeholder for a cross-contamination seal made of Neoprene sheet. The Neoprene sheet is placed between the frame and wall at site.

Bio-Shield Barrier System Option

The Tuttnauer bio-shield system meets BSL3 and BSL4 bio-safety levels using a wall seal (type 3).

- **Jacket Frame** - This system includes a fully welded metal strip surrounding the jacket. It is equipped with threaded studs, counter plate, nuts and necessary pass through fittings for wiring or tube paths.
- **Wall Frame** - The frame is anchored to a concrete wall. Studs, counter plate, nuts and neoprene sheets are used to seal the gap between the wall and the frame.



Components

Steam Supply

The autoclave uses saturated steam as the sterilization agent. The steam can be supplied to the autoclave from the building's central source, a stand-alone generator, or a steam-to-steam generator.

Air Removal Method

Tuttnauer's sterilization method substantially shortens cycle times. Air removal is achieved by evacuating air from the chamber with a liquid ring vacuum pump; combined with steam pulsing.

Piping

The pipes and fittings are constructed from stainless steel and brass. Pneumatically operated valves significantly reduce maintenance and downtime. AISI 316L grade stainless steel piping, fittings, and components are available for clean steam applications. High quality steam can be used for tissue culture work, sterile water preparation and other special processes.

Documentation and Control

The user can use either the classic CAT2007 control panel or the optional advanced touch screen panel with a sophisticated user-friendly PLC control system based on the Allen Bradley® platform. A self-diagnostic system provides messages and alerts that are clearly displayed. The LCD displays constant cycle parameter readouts and cycle progress information. Double door autoclaves can be provided with minimal or full control capabilities on the unloading side.

SCADA Software

The SCADA Software provides a fully PC-controlled communications system. The SCADA software allows complete control and monitoring of up to eight autoclaves. The software retrieves information, prints data on paper, and displays real-time data in graphs and tables on screen.

Printer

For a clear and concise documentation of the sterilization process, the control unit is provided with a built-in printer. This provides real-time cycle data including the pressure, temperature, change of phase, alarms and a summary at the end of the cycle.

Validation Packages

Tuttnauer provides our customers with services to help expedite the validation and commissioning of your equipment, including:

- Factory Acceptance Testing (FAT)
- Site Acceptance Testing (SAT)



Standards

Our high quality research laboratory autoclaves are designed to comply with the strictest international directives and standards in all aspects of the animal care market.

Standards and codes

Tuttnauer products meet the following provisions and standards:

Europe:

- EN 285 for Large Autoclaves
- DIN 58951 Steam Sterilizers for Laboratory Use

USA:

- ST8 – Hospital Sterilizers

Directives & Guidelines:

- Medical Device Directive – MDD 93/42 EEC (will be replaced by MDD 2007/47)
- Pressure Equipment Directives – PED 97/23 EEC
- Low Voltage Directive – 73/23 EEC
- EMC Directive 89/336
- WEE & RoHS Directives – 2002/95, 96

Safety and EMC Standards:

- IEC/UL/EN 61010-1
- IEC/EN 61010-2-040
- EN 61326
- International Protection Level IPx4

Pressure Vessel and Steam Generator Construction Standards:

- ASME Code, Section VIII, Division 1, unfired pressure vessels
- ASME Code, Section I, for boilers
- EN 13445 for Pressure vessels

Good Practice Standards:

- ISO 17665-1 (replacing ISO 13683 and ISO 11134)
- ST79 (replacing ST46 and ST42)

Quality System Standards:

- ISO 9001:2008 (Quality Systems)
- ISO 13485:2003 (Quality Systems for Medical Devices)
- 21 CFR 820

Additional Options

RTD Load Probe / PT100 Option

In addition to the other temperature sensors in the autoclave, a number of optional flexible PT100 temperature sensors can be provided to monitor load temperature in the chamber, particularly useful with sensitive liquid loads which require precise temperature control.

Loading Equipment

All Tuttnauer loading equipment is manufactured from AISI 316L stainless steel material. All bulk size autoclaves can be provided with:

- **Transfer Carriage** - uses heavy duty revolving wheels (castors) to maximize mobility in limited space, and wheel brakes to prevent rolling. There is a lock to prevent the loading cart from sliding.
- **Floor Loading Cart** - pit mounted bulk models can be configured with a loading cart, eliminating the need for a transfer carriage.



Loading Cart & Transfer Carriage



HEPA Air Filter & Sterilization Cycle Option

A sanitary HEPA air filter provides an additional level of security. The filter cartridge is fitted in a stainless steel housing and can be periodically sterilized by the autoclave.

Communication

RS232/485 communication ports are available to meet your communications and monitoring needs.

Modem

In order to support long distance service and troubleshooting, the autoclave can be supplied with a built-in modem. This is only available with the Allen Bradley® based control system.

Other Options

- Seismic Restraints
- Automatic Utility Startup/Shutdown
- Water Saving System

Your Sterilization & Infection Control Partners



Company Profile

For over 80 years, Tuttnauer's sterilization and infection control products have been trusted by hospitals, universities, research institutes, clinics and laboratories throughout the world. Supplying a range of top-quality products to over 100 countries, Tuttnauer has earned global recognition as a leader in sterilization and infection control.

Global Partnerships

At Tuttnauer we feel that business means people dealing with people. We pride ourselves on our reputation for the long-lasting relationships we have with our customers, spanning over decades and distances and built on commitment and trust.

Our Flexibility Is Your Advantage

Beyond our unmatched range of products, we also manage complete turnkey solutions, including planning, design and installation of equipment, as well as consultation and feasibility studies, for projects of all sizes.

More from Tuttnauer:

Featuring Tuttnauer's range of cleaning, disinfection and sterilization solutions



Large Capacity Autoclaves
for Medical Use



Horizontal Steam Autoclaves for
Laboratory & Scientific Applications



Fully Automatic Table-Top
Autoclaves



Manual Table-Top Autoclaves



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