Tuttnauer

Your Sterilization & Infection Control Partners

Partnership

Large Steam Autoclaves for the Life Sciences

Laboratory Line

Large Steam Autoclaves for the Life Sciences

Sterilization in a laboratory environment has its unique requirements. Tuttnauer laboratory autoclave sterilizers are designed to provide high quality repeatable performance and accountability for a wide range of lab applications, including: liquids, glassware, instruments, porous loads and other laboratory items.

Choosing the right steam autoclave depends on several considerations: the type of loads, frequency of use, available services and load volumes. The Tuttnauer line of large capacity autoclaves successfully meets the challenges posed by sterilization in laboratories and research institutes. The autoclaves use pre-vacuum and gravity for air removal and improved steam penetration. The autoclaves cover a wide range of applications for laboratories in research institutes, universities, pharmaceutical and biotechnological industries.

Designed to Handle Diverse Load Types

The laboratory autoclaves are provided with 10 preset cycle programs and 20 customizable cycle programs that range in temperature from 105°C - 138°C. Isothermal cycles are optional. Standard programs are set for:

- Sterilization of Liquids
- Unwrapped instruments and glassware
- Wrapped instruments, packs and utensils

All programs are fully programmable to suit your specific requirements.

Liquid Loads

Unlike instruments, more time is required for liquids to reach sterilization temperature compared to non-liquids. Tuttnauer's autoclaves are equipped with a flexible temperature probe, which can be placed in a reference vessel, ensuring that the set sterilization temperature is actually attained when sterilization starts. Sterilization is initiated only when the probe reaches the preset threshold temperature.

An additional challenge is to minimize load exposure to high temperatures due to the concern that it may be over exposed. Advanced features minimize the time liquids are exposed to high temperatures without compromising on sterilization results.

Fast Cooling

Tuttnauer's accelerated cooling technology increases the amount of cycles per day and protects the load by minimizing its exposure to high temperatures. Rapid cooling safely reduces cooling time by as much as 75% without compromising the load. After sterilization is completed, air is passed through a microbiological filter. Chamber temperature is decreased while pressure reduces and steam and condensate are drained.

Cooling coils are filled with cold tap water to help cool down the chamber to a safe temperature. When the liquid's temperature reaches the final set temperature, the cooling stage is complete.

Water Recycling

The optional water recycling system is a cost-effective environmentally friendly solution that reprocesses the water used for cooling the load. The heat exchanger receives cooled water from the recycling system. The recycling system remains active during autoclave operation.

Improved Air Removal

Vacuum Cycles

The autoclave's vacuum pump efficiently removes residual air prior to sterilization, enabling effective penetration of steam.

The post-vacuum drying phase, at the end of the sterilization cycle, ensures complete drying of porous loads and hollow instruments. This guarantees that even the most difficult loads will easily reach sterility assurance levels.

Advanced Sterilization Cycles

F_0 Cycle – An additional challenge with liquid sterilization is the need to prevent extended exposure of liquid media to high temperatures which may harm the quality of the liquid media. The advanced F_0 optional feature assists in minimizing the time liquids are exposed to high temperatures during sterilization thereby protecting liquid media, saving your laboratory time and reducing energy consumption.

Disinfection/Isothermal Cycle (70-95°C) – A flexible low temperature cycle enables disinfection ("low" temperature isothermal). Temperature range settings are flexible within 70°C - 95°C range.

Advanced Options

Advanced options allow for sanitary conditions to be maintained, and satisfy stringent requirements for the pharmaceutical, biotechnology and food processing industries.

316L grade stainless steel piping, fittings and components are used for clean steam contact surfaces. High quality steam can be used for tissue culture, sterile water preparation, research and other applications.

Sanitary Tri-Clamp Fittings are manufactured from stainless steel. All surfaces are finely finished and smoothed for non-contaminating flows. They eliminate the possibility of external contamination penetration through the valves and piping connection areas and add rigidity to the piping system.

Separate Jacket and Chamber Connections enable reaching sterilization temperatures faster and improve temperature control. Often used for sterilizing liquids and vital when working with clean steam.

Diaphragm valve allows for maximal drainability and minimise the risk of contamination.

Hot-Well is a stainless steel water reservoir in which water is heated to 80-90ºC to remove non-condensable gases prior to entering the steam generator.

Sanitary Air Filter – A 0.2 µm air filter ensures that bacteria free air enters the chamber. A SIP provision is available for the sanitary filter.

Advanced Control System for Your CSSD

Take advantage of Tuttnauer's sophisticated user-friendly control systems for repeatable high performance. Choose either Tuttnauer's sophisticated Bacsoft controller or the Allen-Bradley (AB 1400 PLC) controller.

Standard Features

- 7" Multi-color touch screen panel
- Keypad control panel on second door of two door autoclaves with Bacsoft controller
- Stores the last 200 cycles in built-in memory (Bacsoft)
- Multiple access levels and user passwords to control access/ operation of the autoclave
- Diagnostic In/Out test (enables technician to check each system component separately)
- Sterilization Temperature range 105°C to 138°C
- F_0 software control
- PID (Proportional Integral Differential) pressure control
- Two PT100 sensors according to EN 61010-1, EN 61010-2-040
- 21 CFR part 11

Optional Features

- 10" Multi-color touch screen
- Up to 8 different barcode readers
- Independent Recording for cross-checking cycle measurements
- Disinfection/Isothermal Temperature range from 70°C to 95°C

Sophisticated Touch Screen HMI

The HMI (Human Machine Interface) has been designed with the following considerations:

- Multi-color display for easier reading from a distance
- Multilingual (26 languages)
- Graphical display of Temperature and Pressure trend graphs

R.PC.R Software

Automatic Recording of Cycle Information to Your PC

Reporting You Can Rely On

- Automatic recording of cycle information to any PC on your network
- Convenient access to graphs and tables that are easy to understand
- Easily generate PDF reports
- No need to file printouts, saving you time

Be in Control with Real-Time Remote Monitoring

- See the real-time autoclave display on your PC
- Monitor all activity for up to 8 autoclaves

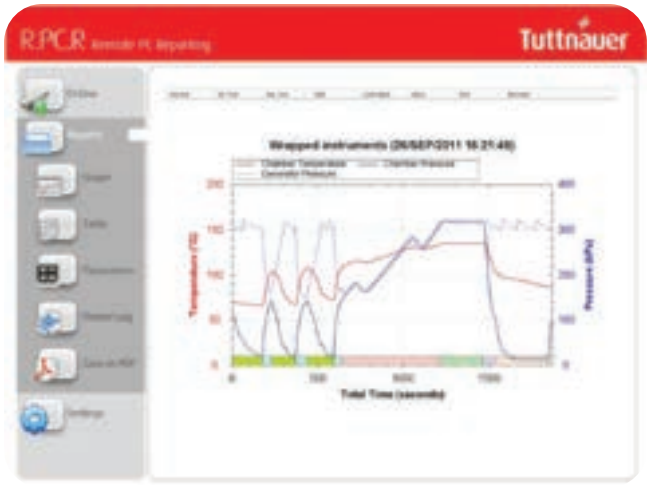
With R.PC.R you can see: Graphs of the cycle data, Numeric cycle data, cycle print-outs, measured values table, parameter table.
Note:

- R.PC.R monitoring feature is not available with Allen Bradley controller

Documentation Package

An optional full documentation package is available:

- Installation Qualification (IQ)
- Operation Qualification (OQ)
- Performance Qualification (PQ)



Biosafety and Waste Treatment Facilities

Tuttnauer supplies full sterilization solutions for the treatment of bio-hazardous materials and waste. Tuttnauer autoclave sterilizers can be customized to meet the specific requirements of laboratories classified as BSL3/4 (Bio-Contaminant Level 3 or 4) where harmful pathogens that leave the sterilizer prior to disposal must be fully sterilized. The bio-hazardous waste sterilization cycle will efficiently process any load without risk to the environment.

These autoclaves are supplied with a thermal effluent decontamination stage that sterilizes chamber air and waste water prior to their release into the atmosphere and drain. An additional sterilization system is incorporated into the autoclave which prevents bio-hazardous aerosol generation. During the air removal phase, the exhaust, aerosol and condensation pass through a secondary sterilization treatment that sterilizes the effluent. During the heating and sterilization phases all effluent is not allowed to exit the chamber until the sterilization phase is fully complete.

Safety

Safety is Our Top Priority

Safety of personnel is an important issue. Tuttnauer autoclaves include numerous safety features/systems to ensure a safe work environment.

Door Safety

The laboratory autoclaves are designed with a number of independent mechanical and digital safety features:

- In case of failure the clean door remains closed in order to protect the clean area from contamination
- A safety device prevents the operator from opening the door when the chamber is pressurized
- Steam will not to enter the chamber when the door is open
- A cycle cannot start if the door is open or not properly locked
- The door cannot unlock until liquid temperature reaches the predetermined end temperature
- The door cannot unlock until chamber pressure reaches room pressure
- An air inflated door gasket creates a hermetic seal between the door and chamber
- **Sliding Door Safety** - sliding door progress will automatically stop if an obstruction is detected
- **Double Door Safety** - interlocks prevent both doors from being opened simultaneously

General Safety Features

- **Double Independent Monitoring:** The combined electronic and mechanical monitoring ensures that the operator has two independent means to monitor pressure
- **Safety Valves:** If the pressure exceeds the allowed limit the safety valves will discharge
- **Built-in Steam Generator Safety:** A water level monitoring system maintains a constant water level and ensures safe operation of the heaters
- **Emergency shut-off:** Easily accessible emergency switches for immediate cycle shut-off

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 barrier 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.

A Flexible Range of Sizes and Models

Tuttnauer offers an unmatched range of models that are available in three series: Compact, Mid Range and Large Capacity. The chamber sizes range from 120 to 8840 Liters. In addition, we accommodate your special requirements and provide non-standard chamber sizes. Each model is available with either single or double doors.

Tuttnauer also offers the T-Max line of autoclaves with chamber sizes which comply with the European StU (Sterilization Units) requirement.

44 and 55 Compact Series

Tuttnauer Small Laboratory Autoclaves with chamber volumes from 120 to 310 liters.

The 44 and 55 series is available with two door options:

- Fully automatic vertical sliding door
- Manual Hinged Door

Model	Chamber Dimensions (WxHxD) mm	Chamber Volume (Liter)
4472	408x408x730	120
4480	408x408x845	140
4496	408x408x970	160
5596	508x508x970	250
55120	508x508x1210	310

Manual Hinged Door

Vertical Sliding Door

66 Mid Range Series

Tuttnauer Medium Laboratory Autoclaves with chamber volumes from 340 to 760 liters.

The 66 series is available with the following two door options:

- Fully automatic vertical sliding door
- Hinged door with automatic locking

Model	Chamber Dimensions (WxHxD) mm	Chamber Volume (Liter)
6690	610x610x915	340
66120	610x610x1215	450
6671130	660x710x1295	610
6671162	660x710x1620	760

Vertical Sliding Door

Automatic Hinged Door

69 Large Capacity Series

Tuttnauer Large Laboratory Autoclaves with chamber volumes from 510 to 1010 liters.

The 69 series is available with two door options:

- Fully automatic horizontal sliding door
- Hinged door with automatic locking

Model	Chamber Dimensions (WxHxD) mm	Chamber Volume (Liter)
6990	610x910x915	510
69120	610x910x1215	680
69150	610x910x1515	840
69180	610x910x1815	1010

Automatic Hinged Door

Horizontal Sliding Door

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.

Floor or Pit Mounted Autoclave Models

Model	Chamber Dimensions (cm) (W x H x D)	Volume (Liter)
Floor Mounted		
364853	92 x 122 x 136	1500
364860	92 x 122 x 151	1700
364872	92 x 122 x 182	2000
3648144	92 x 122 x 363	4000
Pit Mounted		
366260	92 x 158 x 152	2210
358686	90 x 220 x 218.5	4330
428686	107 x 220 x 218.5	5145
498686	125 x 220 x 218.5	6100
728686	183 x 220 x 219.5	8840

Loading Equipment

Our loading equipment assists the loading and unloading process. It is made of high quality, durable stainless steel. We offer three options:

- **Pull Out Trays.** Stainless steel trays equipped with rails for easy loading and unloading. The rails are designed to prevent the trays from rolling over.
- **Loading Carts and Transfer Carriages.** The adjustable loading cart rolls from the transfer carriage onto the interior chamber tracks for easy handling of heavy loads. The trolley is equipped with revolving wheels, maximizing mobility in limited space. The wheel breaks prevent the trolleys from rolling and the carriage is equipped with a lock that prevents it from sliding.
- **Automatic Loader.** Designed for loading/unloading baskets. The control of the loader is integrated with the control of the autoclave.

Standards:

Our high quality laboratory autoclaves are designed to comply with the strictest international standards and directives.

Directives

PED 97/23/EC, 2006/42/EC Machinery, 6002/59/EC Electrical equipment, 2004/108/EC Electromagnetic compatibility

Technical Standards

EN285: 2006+A2:2009, DIN 58951-2:2003, ANSI/AAMI - ST 8: 2008, ASME Code Sec. I and Sec. VIII Div.1, EN 61326-1: 2006, EN 17665-1: 2006

Quality Management System Standards

ISO 9001:2008 and ISO 13485:2003, Compliance with FDA QSR 21 CFR part 820 & part 11, Canadian MDR (CMDR) SOR/98-282 (2006) consolidated

Intertek

ASME

0344

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Company Profile

For over 88 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.

More from Tuttnauer

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

Pharmaceutical autoclaves designed in accordance with cGMP guidelines

Vertical autoclaves for liquid, glassware, and biohazardous waste

Benchtop autoclaves for life science applications

Laboratory Line

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