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Tuttnauer

Your Sterilization & Infection Control Partners





Laboratory Line

Large Steam Sterilizers for the Life Sciences

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Large Steam Sterilizers for the Life Sciences

Sterilization in a laboratory environment has its unique requirements. The types of loads that need to be sterilized are varied and include liquids, glassware, instruments, porous loads and additional laboratory items.

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



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Designed to Handle Diverse Load Types

The Tuttnauer line of laboratory sterilizers can handle a variety of load types. The sterilizer is provided with a total of 12 programs that range in temperature from 105°C - 137°C. If needed the number of programs can be increased. Standard programs are set to handle:

- Sterilization of Liquids
- Unwrapped instruments and glassware
- Wrapped instruments, packs and utensils
- 2 test programs: Bowie & Dick and Vacuum Test

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

Liquid Loads

Unlike surgical 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 is 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 the need to prevent media exposure to high temperatures for a long time, for the concern that it might overcook. Tuttnauer offers advanced options that minimize the time liquids are exposed to high temperatures without compromising on sterilization results.

Fast Cooling

After sterilization is attained, the autoclave door cannot be opened immediately, until the chamber has properly cooled down. A sudden drop in chamber pressure and temperature can cause liquids to boil over.

Tuttnauer's accelerated cooling technology reduces the amount of cycles per day and protects the load by minimizing its exposure to high temperatures. Rapid cooling typically reduces cooling time by as much as 75%. After sterilization is completed, compressed air is passed through a microbiological filter. Chamber temperature is decreased while pressure increases 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 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.

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Improved Air Removal

Vacuum Cycles

For wrapped, porous and hollow loads the sterilizer'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 – F_0 refers to the "equivalent kill effect" which is calculated during the heat-up phase of a sterilization cycle resulting in reduced total exposure times. Sterilization exposure time begins when the slowest-to-heat load temperature sensor within the autoclave has reached a predetermined set temperature.

Streaming Steam Cycle (105°C) – The streaming cycle is most commonly used for melting agar in Petri dishes. It is a low temperature sanitation cycle set at 105°C. Steam is allowed to enter the chamber and the fast exhaust valve is opened to allow steam to stream over the contents of the unit.

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

The advanced options are designed specifically for use in clean steam systems that demand sanitary conditions be maintained. They are designed to satisfy the stringent requirements of the food processing, pharmaceutical and biotechnology 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.

Clean Steam Generators

Tuttnauer offers two types of clean steam generators:

The Stainless Steel Steam Generator's components, including heaters and piping are constructed from 316L grade stainless steel.

The Steam to Steam Generator is a highly advanced clean steam generator which produces pure steam. It uses steam as the energy source. It is constructed from 316L grade stainless steel.

The 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.

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

A Diaphragm Valve is used to prevent bio-burden.

The Hot-Well is a stainless steel water reservoir, in which the water is heated to 80-90ºC prior to entering the steam generator. The hot-well enables the removal of non-condensable gases.

Sanitary Air Filter – a bacteria retention air admission filter provides an additional level of security. The filter is periodically sterilized by the autoclave.

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Waste Treatment Facilities and Biosafety

Autoclaves used in laboratories and animal care facilities that are classified as Bio-safety Level 4 must have a pass-through double door sterilizer, with interlocks that provide protection against the passage of potentially contaminated materials to the surroundings. A bio-seal must be installed and maintained around the unit at the containment barrier to seal the space.

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



These sterilizers 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.

Documentation and Control

An automated process control uses the Tuttnauer advanced microprocessor control system. Our Cat2007 Control Panel is user-friendly, and consists of a 4 line, 20 column LCD screen with a functional touchpad. A self diagnostic system provides messages and alerts that are clearly displayed. Audible alerts are sounded with the messages. The LCD displays constant cycle parameter readouts and cycle progress information. Double door autoclaves are provided with full-display status indicators on the unloading side.

The automated control system is fully programmable and enables easy cycle selection.

Printer

Cycle documentation is easily attained with the built-in printer. It provides detailed real-time cycle data, as it appears on the control panel display and records a detailed history. In the case of a sterilization failure complaint the documentation can help track the problem.

The RS 232 Port

The RS 232 port enables direct PC access, software updates and remote maintenance.

IQ OQ PQ Validation Package

Tuttnauer offers IQ OQ and PQ documentation and services.





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Quality

Engineered with People in Mind

Quality features enable the convenience and durability needed to operate an autoclave with complete peace of mind. The fully jacketed chamber is constructed from long lasting 316L/Ti grade stainless steel with superior corrosion resistance. The generator and piping are constructed of stainless steel. The pneumatic valves significantly reduce maintenance. They are safer and more reliable, eliminating the requirement for high voltage. Furthermore, if no buttons or switches are operated for four hours, the autoclave will switch to standby mode.

Two Validation Ports are available for thermocouple chamber entry, pressure sensors and measuring devices.

Standards:

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

Pressure Equipment Directive: PED 97/23 EEC, ASME Code Sec. VIII and I, IEC/UL/EN 61010-1, 61010-2-04 and 61010-2-040, EN 61326, EN285 ST-8 EN554 ISO 13485:2003 for the Quality System.

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Safety

Safety is Our Top Priority

Our safety features ensure functionality and a worry-free work environment which results in reduced downtime.

Door Safety

The autoclave doors are designed with a number of independent mechanical and digital safety features. This guarantees that if a problem should occur, an autoclave failure will be prevented.

- A safety device prevents the operator from opening the door when chamber is pressurized
- Steam is not allowed into 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 chamber pressure reaches atmospheric pressure and liquids temperature is reduced to a safe temperature
- **Sliding Door Safety -** The sliding door progress will automatically stop if an obstruction is detected
- **Double Door Safety -** Interlocks prevent both doors from being opened simultaneously
- **Temperature Activated Door Lock -** The door will not open until the temperature reaches a predefined end temperature

General Safety Features:

- **Double Independent Monitoring-** The combined digital and mechanical monitoring provides a cross reference and guarantees accurate results. The operator has two independent means to monitor temperature and pressure
- **Safety Valves-** Both the chamber and the jacket are equipped with 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

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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 sterilizer chamber ranges in size from 120 to 1015 liters. Additionally, we design tailor made solutions and non-standard chamber sizes to accommodate special needs. Each model is available with either single or double door.

In addition to the laboratory line Tuttnauer offers the T-Max line of sterilizers with chamber sizes which comply with the European StU (Sterilization Units) requirements.

The 44 and 55 Compact Series

Tuttnauer Small Laboratory Autoclaves with chamber volumes from 120 to 320 liters.

The 44 and 55 series is available with the following door options:

- Fully automatic vertical sliding door
- Manual Hinged Door

Tuttnauer offers 5 different models:

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

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The 66 Mid Range Series

Tuttnauer Medium Laboratory Autoclaves with chamber volumes from 340 to 600 liters.

The 66 series is available with the following door options:
- Fully automatic vertical sliding door
- Hinged door with automatic locking.

Tuttnauer offers 5 different models:

Model	Chamber Dimensions (WxHxD) mm	Chamber volume (Liter)
6690	610x610x915	340
66120	610x610x1215	450
666690	660x660x915	400
6666120	660x660x1215	530
6666137	660x660x1370	600





Vertical Sliding Door



Automatic Hinged Door

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The 69 Large Capacity Series

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

The 69 series is available with the following door options:

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

Tuttnauer offers 4 models:

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

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Additional Options

Loading Equipment

Our loading equipment assists the loading and unloading process. It is made of high quality, durable stainless steel. We offer two 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 Cart and Transfer Carriage -** The height adjustable loading cart rolls off the transfer carriage onto the interior chamber rails for easy handling of heavy loads. The transfer carriage is equipped with swivel wheels, maximizing maneuverability in limited space. The wheel breaks prevent the carriage from rolling and the cart is equipped with a lock that prevents it from sliding.









High Precision Documentation

Cycle documentation is crucial within the laboratory. A cycle that is not properly recorded is not considered done. The modularity and flexibility of our system gives you targeted and customized solutions to track and document the sterilization process.

- **Touch Screen**
  A built in touch screen displays all cycle information using a textual and graphical interface and provides a continuous visual guide. Moreover, it provides a visual display of all piping for monitoring purposes.
- **ADMC software**
  The user can remotely control and manage eight autoclaves using the ADMC software. You can retrieve data, create graphs, tables and print-outs.



- **Chart Recorder**
  The Chart Recorder gives clear analog trend records and print-outs in color. It is simple to operate and has an easy viewable display.
- **Data Logger**
  The data logger is the ideal protection, making documentation even more convenient and reliable. It stores over 100,000 hours of cycle data, displayed either graphically or numerically.
- **Barcode Reader**
  The barcode reader allows for tracing material flow in the laboratory by reading the containers' barcode identification. The data is transferred to the ADMC and linked to the sterilization cycle parameters for streamlined instrument handling.

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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 Sterilizers for Medical Use



Washer disinfectors for hospitals and laboratories



Laboratory autoclaves ranging in size and application



Pre & post vacuum tabletop sterilizers designed to perform class B cycles

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