Systec Laboratory Autoclaves

Systec V-Series. Vertical floor-standing autoclaves.
Systec D-Series. Horizontal bench-top autoclaves.

Systec
the autoclave company

Performance and competence.

Experience counts

We only make two things. Laboratory autoclaves and devices for the improved sterilization and handling of culture media. Always with the goal of making laboratory work safer, easier, more accurate, reproducible and validatable, and consequently more economical. With over 20 years of experience and continuous intensive cooperation with experts and users, we know how to provide optimal solutions for even the most complex sterilization tasks.

We have the knowledge and experience to produce the best results!

Our expertise and know-how are available for you worldwide through specialized and specially selected partners.

The power of innovation. For better sterilization.

Systec laboratory autoclaves

Specially developed for laboratory sterilization applications, Systec autoclaves make processes safer, easier, accurate, reproducible and validatable.

Systec autoclaves can be used in all laboratory applications, even in demanding sterilization processes: the sterilization of liquids (such as nutrient and culture media), solids (such as instruments, pipettes, glassware), waste (destructive sterilization of liquid waste in bottles, or solid waste in destruction bags) and biological hazards in safety laboratories.

Contents

Systec V-Series.
Vertical floor-standing autoclaves.

Compact dimensions

The Systec V-series of top-loading vertical autoclaves is distinguished by its small footprint and high chamber capacity. Result: optimal loading capacity with most standard media bottles and Erlenmeyer flasks.
Up to 50 % more loading capacity.

8 models
40 to 150 l
chamber
capacity

Systec V-40 | Systec V-55 | Systec V-65 | Systec V-75 | Systec V-95 | Systec V-100 | Systec V-120 | Systec V-150

Dimensions and performance

Systec	V-40	V-55	V-65	V-75	V-95	V-100	V-120	9.3V-150
Chamber dimensions Ø x depth (mm)	344 x 450	344 x 600	400 x 500	400 x 600	400 x 750	500 x 500	500 x 600	500 x 750
Chamber volume (l) total / nominal	45 / 40	60 / 55	73 / 65	85 / 75	104 / 95	117 / 100	137 / 120	166 / 150
External dimensions (mm)								
Height	950	950	995	995	1080	985	985	1115
Width	500	500	550	550	550	650	650	650
Depth	680	680	780	780	780	900	900	900
Net weight (kg)	110	115	125	130	140	175	180	190
Heating capacity (kW)								
Systec VX	3.5	3.5	9.0	9.0	9.0	9.0	9.0	9.0
Systec VE and VB	3.6	3.6	9.3	9.3	9.3	9.3	9.3	9.3

Electrical connections for Systec V-40 and V-55: 220 – 240 V, 50 / 60 Hz, 16 A.
Electrical connections for Systec V-65 to V-150: 380 – 400 V, 50 / 60 Hz, 16 A.
Other voltage supplies are available on request.
Country-specific deviations possible.

Loading capacity* Erlenmeyer flasks

Systec	V-40	V-55	V-65	V-75	V-95	V-100	V-120	V-150
250 ml	3 x 11	4 x 11	3 x 14	4 x 14	5 x 14	3 x 22	4 x 22	5 x 22
500 ml	2 x 7	3 x 7	2 x 8	3 x 8	4 x 8	2 x 14	3 x 14	4 x 14
1000 ml	2 x 4	2 x 4	2 x 5	2 x 5	3 x 5	2 x 8	2 x 8	3 x 8
2000 ml	3	2 x 3	4	2 x 4	2 x 4	6	2 x 6	2 x 6
3000 ml	1	1	2	2	2 x 2	4	4	2 x 4
5000 ml	1	1	1	1	2 x 1	3	3	2 x 3

Loading capacity* Schott DURAN® media bottles

Systec	V-40	V-55	V-65	V-75	V-95	V-100	V-120	V-150
250 ml	3 x 17	4 x 17	3 x 20	3 x 20	5 x 20	3 x 30	3 x 30	5 x 30
500 ml	2 x 11	3 x 11	2 x 15	3 x 15	4 x 15	2 x 22	3 x 22	4 x 22
1000 ml	8	2 x 8	2 x 9	2 x 9	3 x 9	2 x 15	2 x 15	3 x 15
2000 ml	4	2 x 4	5	2 x 5	2 x 5	8	2 x 8	2 x 8
5000 ml	1	1	2	2	2 x 2	4	4	2 x 4
10000 ml	1	1	1	1	1	2	2	2

* At maximum load, without baskets
Loading capacities may differ, depending on the option chosen.
The loading capacities may vary slightly, depending on the size of the bottles or flasks.

Systec D-Series.
Horizontal bench-top autoclaves.

Compact dimensions

The Systec D-Series are front-loading, bench-top autoclaves available in seven sizes with chamber capacities ranging from 23 to 200 l. Compact on the outside but with ideal chamber capacities inside. Each size has an optimal loading capacity for most standard media bottles and Erlenmeyer flasks.


Systec D-23


Systec D-45


Systec D-65


Systec D-90


Systec D-100


Systec D-150


Systec D-200

Dimensions and performance

Systec	D-23*	D-45	D-65	D-90	D-100	D-150	D-200
Chamber dimensions Ø x depth (mm)	260 x 420	344 x 500	400 x 500	400 x 700	500 x 500	500 x 750	500 x 1000
Chamber volume (l) total / nominal	25 / 23	50 / 45	70 / 65	95 / 90	113 / 100	162 / 150	211 / 200
External dimensions (mm)							
Height	490	585	630	630	730	730	730
Width	545	620	750	750	850	850	850
Depth	645	755	770	970	805	1055	1305
Net weight (kg)	80	105	125	145	165	190	210
Heating capacity (kW)							
Systec DX	2.9	3.5	9.0	9.0	9.0	9.0	9.0
Systec DE and DB	2.3	3.7	3.7	5.5	3.7	5.5	5.5

*Please note: Systec DB-23 not available!

Electrical connections for Systec D-23 and D-45: 220 – 240 V, 50 / 60 Hz, 16 A.
Electrical connections for Systec D-65 to D-200: 380 – 400 V, 50 / 60 Hz, 16 A.
Other voltage supplies are available on request.
Country-specific deviations possible (Switzerland: Systec DX-23)

Loading capacity** Erlenmeyer flasks

Systec	D-23	D-45	D-65	D-90	D-100	D-150	D-200
250 ml	11	24	23	31	2 x 30	2 x 42	2 x 59
500 ml	8	12	15	21	2 x 15	2 x 24	2 x 40
1000 ml	3	8	9	13	12	18	23
2000 ml	–	3	6	8	7	9	14
3000 ml	–	–	3	4	6	8	11
5000 ml	–	–	–	–	3	5	7

Loading capacity** Schott media bottles

Systec	D-23	D-45	D-65	D-90	D-100	D-150	D-200
250 ml	18	24	31	40	2 x 36	2 x 54	2 x 83
500 ml	10	18	23	31	2 x 26	2 x 40	2 x 59
1000 ml	4	10	15	18	18	26	40
2000 ml	–	5	8	10	12	14	23
5000 ml	–	–	3	4	6	8	11
10000 ml	–	–	–	–	2	3	4

** At maximum load, without baskets
Loading capacities may differ, depending on the option chosen.
The loading capacities may vary slightly, depending on the size of the bottles or flasks..

Systec V-Series and D-Series.
Three model ranges with different performance.

Systec VX/Systec DX

VX DX

For all laboratory applications, including sophisticated state-of-the-art sterilization processes. With numerous options for validatable sterilization.

Systec VE/Systec DE

VE DE

For basic laboratory applications.
With limited options for process optimization.

Systec VB/Systec DB*

VB DB

For simple process applications. No options available for process optimization.

*Please note: Systec DB-23 not available!

	VX	DX	VE	DE	VB	DB
Standard Features						
Integrated, separate steam generator	■					
Internal heating elements within the autoclave chamber				■		■
Housing, support frame and pressure vessel made of corrosion-resistant stainless steel	■			■		■
Temperature and pressure range 140 °C, 4 bar (except for Systec D-23)	■			■		■
LCD display and fully automatic microprocessor control	■			■		■
Number of sterilization programs	up to 25*			12		3
Code-secured access rights for changing parameters and further safety-relevant intervention	■			■		■
Internal memory for storing up to 500 sterilization cycles	■			■		
Timer for starting programs	■			■		
Autofill: automatic demineralized water feed for steam generation	■			■		
Flexible PT-100 temperature sensor	■			■		■
Additional temperature sensor in condense exhaust	■					
Temperature holding function for liquids after program finish	■			■		
Special program for Durham tubes	■			■		
Calculation of F0 value	■			■		
Special program for waste sterilization with pulsed heat-up for more efficient air exhaust	■			■		
Water-cooled steam exhaust, thermostatically controlled	■			■		
Programmable automatic door-opening on completion of program	■			■		
RS-232 and RS-485 interfaces for external data transmission (network-compatible)	■			■		
Available options						
Touch-Screen control (Systec V-Series only)	□					
Extension of temperature and pressure ranges to 150 °C/5 bar (from chamber volume 65 liters and more)	□			□		
Options for process optimization						
Rapid cooling for efficient and safe cooling of liquids	□			□		
Vacuum system for validatable sterilization of solids and waste materials in disposal bags	□					
Superdry: for drying solids (only in combination with optional vacuum system)	□					
Exhaust filtration (including condensate inactivation) for safe sterilization of hazardous biological substances	□			□		
Options for documentation						
Integrated printer for batch documentation	□			□		□
Systec ADS documentation software package f. comprehensive documentation	□			□		
Documentation SD: data storage on SD card for up to 10,000 sterilization cycles and transmission of data to a PC	□			□		
Systec ADS CFR documentation software package with conformity to FDA 21 CFR Part 11**	□					
AuditTrail: unalterable and traceable documentation acc. to FDA 21 CFR Part 11**	□					

** for Systec VX-65 to Systec VX-150 in combination with a touch display
– Systec autoclaves are delivered ready for subsequent installation of all options.
– Further options and special programs as well as baskets and inserts, transport and loading systems on request.
– Please note: Systec DB-23 not available!

■ = Standard
□ = Optional
* On request

Systec D-23 and D-45 with feed water reservoir

This makes both autoclaves mobile and flexible. With no fixed water connection, they can be used flexibly in different locations. They can also be allocated directly to a specific work station on a temporary basis.

Design – pure innovation.

State-of-the-art engineering

Systec autoclaves are state-of-the-art, both in their mechanical and electrical components; ensuring a new quality of laboratory sterilization processes. The enhanced components enable the lab to meet appropriate requirements for today and the future.

All-round quality
The pressure vessel is made of corrosion-resistant stainless steel 1.4571 (V4A) AISI 316 Ti and is thus easy to clean. An approved safety valve for excess pressure is included. The autoclave support framework and housing are also made of stainless steel. The highly efficient, high-quality Hanno-Tect insulation material releases no particles; Systec autoclaves can thus be used under clean-room conditions.

Dual sensors as standard
Temperature and pressure are controlled via an electronic pressure sensor, as well as via a flexible temperature sensor in the chamber or in a reference vessel (with liquids). Systec VX/DX autoclaves also have an additional temperature sensor in the floor drain.

Systec autoclaves are fitted with the following connections at the rear:

	VX/DX	VE/DE	VB/DB
Demineralized water inlet for steam generation	■	■	
Compressed air	□	□	
Cooling water	■	■	
Common outlet	■	■	■
RS-232/RS-485 interfaces	■	■	
Flexible power cord with CEE plug	■	■	■

■ = Standard
□ = Optional

All according to norms and regulations

Systec autoclaves are equipped as standard for sterilization temperatures up to 140 °C and a steam pressure of 4 bar.

Exception: Extension of temperature and pressure to 150 °C/5 bar is not available for Systec D-23, D-45, V-40 or V-55 systems.

Equipped for the future! Systec V- and D-Series are the first to be equipped for higher temperatures and pressures. The pressure vessel is designed for operations at 150 °C and 5 bar. Optional temperature and pressure range extension accessories adapt all control and safety components to the higher temperature and pressure. This option can be retrofitted.

Exception: Systec D-23 autoclaves are equipped only for 136 °C and 3.8 bar.

Systec autoclaves comply with the following standards:

Pressure vessel:
- 2014/68/EU Pressure Equipment Directive
- ASME Boiler & Pressure Vessel Code, Section VIII, Division 1
- China Stamp

Other guidelines:
- 2014/35/EU Low Voltage Directive
- 2014/30/EU on Electromagnetic Compatibility
- 2006/42/EC Machinery Directive

All autoclaves are CE marked.

We will be happy to provide a complete list of standards and summary of regulations on request.

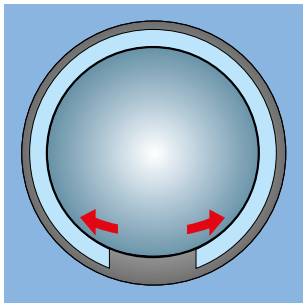
Safety and convenience

Novel automatic door-opening system
Easy but safe – on closing, the door is automatically locked by a circumferential ring system*. A special lip seal made of heat-resistant silicone provides reliable tightness; the more the steam pressure increases, the tighter the seal becomes – without the need for additional compressed air or other media!

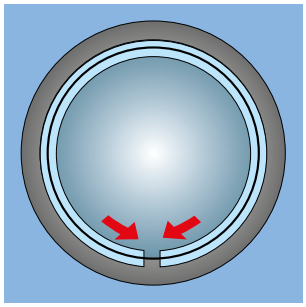
The door-locking system is temperature-dependent according to pressure vessel regulation DIN EN (IEC) 61010-2-040.
The door remains locked as long as there is excess pressure in the chamber. The door and other parts of the pressure vessel and housing are made of stainless steel. The attractively designed front cover, which also incorporates the control panel, display and parts of the control processing system, is made of heat-resistant, insulating plastic. There is thus no risk of the operator coming into contact with hot components.

Automatic door-opening
The autoclave door functions automatically – either by pressing a button or for model ranges VX/DX and VE/DE automatically at the end of a program. A simple system but most useful in practice. Residual steam is exhausted automatically without intermission. Residual heat is used to dry the items being sterilized during the final short phase in the autoclave. Automatic door-opening is restricted to an angle of approx. 15°; this avoids possible contamination from the outside. Especially when items to be sterilized have to remain in the autoclave for cooling and drying this facilitates the working process. Subsequently, for removing the sterilized items, the door can be completely opened manually.

* Exceptions:
In the case of model D-23, a hook mechanism is used instead of a locking ring system. In models D-45, V-40 and V-55, the door is closed by means of a bolt.



Door open, circumferential locking ring in the "ready" position.



Door closed, circumferential locking ring in locking position. The internal steam pressure presses the lip seal between door and chamber.

Design – pure innovation.

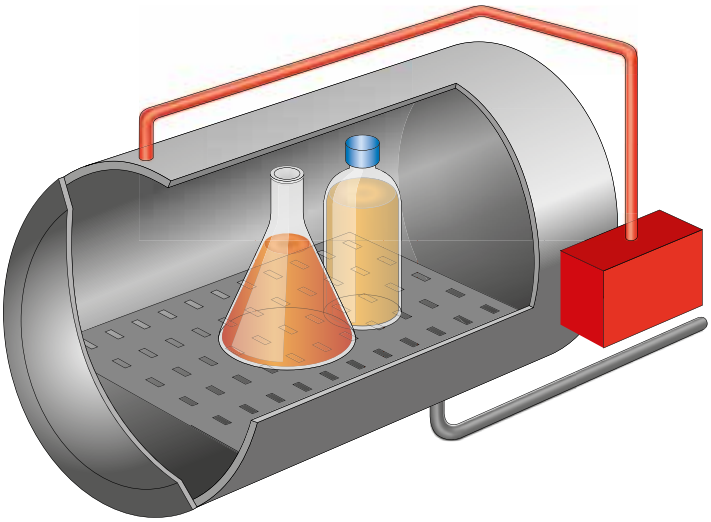
Steam generation by steam generator

VX DX

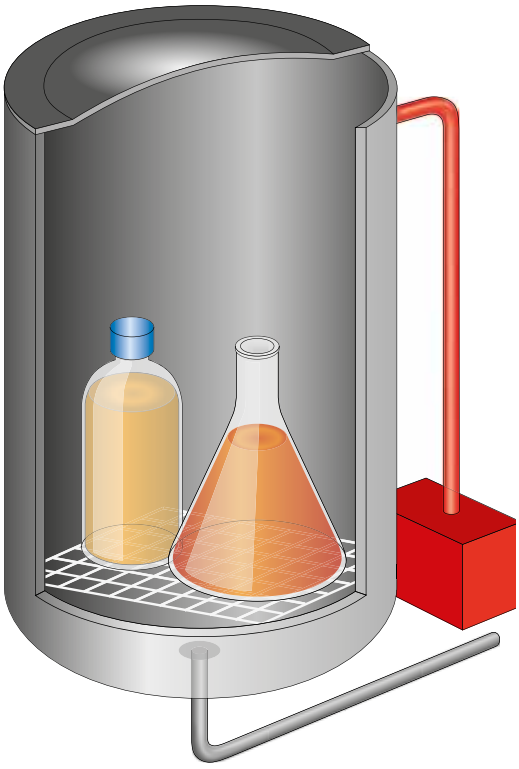
A separate steam generator is incorporated in the housing.

This has numerous advantages:

- No heating elements and no reservoir for dirty water in the chamber.
- In conjunction with the stand-by pre-heating function, only 10 min. heating time to 121 °C with an empty chamber is required.
- Improved air removal by suppressing the air to the bottom with its natural gravitation.
- Accuracy better than ± 0.3 K with empty chamber.
- Quicker cooling as neither the hot water in the chamber nor the separate steam generator need to be cooled.
- After cooling, steam is immediately available for the next sterilization run.



Systec D-Series

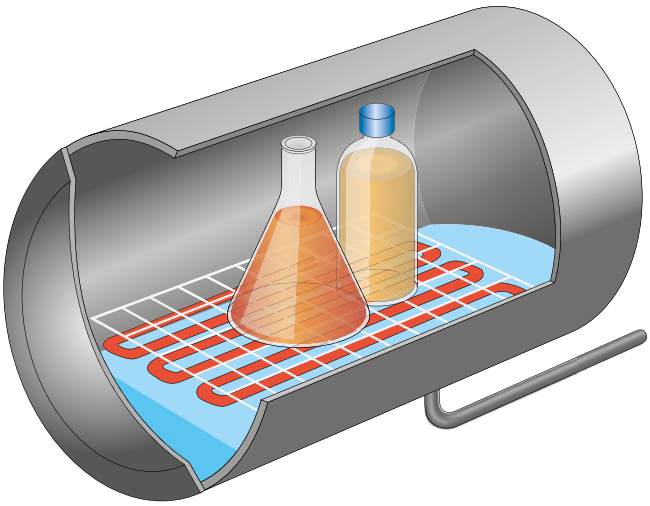


Systec V-Series

Conventional steam generation

VE VB DE DB

In this system, powerful heating elements are integrated directly at the bottom of the sterilization chamber. As required, water can be fed in manually or in models VE and DE, demineralized water can be fed in automatically using the DI-Water connection.



Systec D-Series

Systec V-Series

Condensation of steam instead of removal

VX VE DX DE

Exhaust steam is condensed automatically via a PT-100-regulated cooling system. This prevents odors and protects waste water piping that may be made of plastic.

Everything under control.

Standard operation via display

In all Systec V- and D-Series autoclaves, control is via a membrane keypad with acoustic confirmation of input. The display is large and easy to read. Everything is logically positioned, ergonomic and easy to operate. Menu operation is in text form, selectable in German, English, French, Spanish and Italian – other languages optional.

All control functions are carried out by a specially developed microprocessor. Along with steam pressure, temperature and sterilization time, it also controls all options such as rapid cooling, pre- and post-vacuum and drying.

Available programs* VX DX

1 – 3	Solids
4 – 5	Waste bags
6	Liquid waste with regulated steam exhaust for cooling
7	Liquid waste with self-cooling
8 – 10	Liquids with regulated steam exhaust for cooling
11	Liquids with self-cooling
12	Cleaning
13	Vacuum test**
14	Bowie-Dick Test**
15 – 25	Free for individual programming

Available programs* VE DE

1 – 3	Solids
4 – 5	Waste bags
6	Liquid waste with regulated steam exhaust for cooling
7	Liquid waste with self-cooling
8 – 10	Liquids with regulated steam exhaust for cooling
11	Liquids with self-cooling
12	Cleaning

Available programs* VB DB

1	Solids
2	Waste bags
3	Liquids with regulated steam exhaust for cooling
4	Cleaning

*All programs can be individually parametered.
** Only in combination with vacuum system.

Optional operation by Touch-Screen technology for all Systec VX models from 65 liter chamber volume

VX

Operation is easy and rapid via a large (5.7 inch), highly visible touch screen interface. This innovation offers additional options and increased flexibility when working with the autoclave.

For example, process data can be displayed numerically or graphically. 7 programs are pre-defined but can be expanded (up to 100) as required by the user.

To initiate a new program, the user is guided through the process by menu dialog. Every new program is automatically allocated a permanent, unalterable name and can also be given an individual designation by the user. All process parameters can be individually altered.

Pre-defined programs

1 Solids
2 Waste bags
3 Liquid waste
4 Liquids
5 Cleaning
6 Vacuum test*
7 Bowie-Dick test*

These can be expanded to 100 sterilization programs.
*Only in combination with a vacuum device.

Information:
Systec H-Series (separate brochure) autoclaves are equipped with Touch-Screens as standard.

Everything under control.

Options for documentation

VX VE VB DX DE DB

Printer
Optional integrated printer for documentation of program type, batch number, date / time, temperature / pressure progress and sterilization phase.

VX VE DX DE

Systec ADS documentation software package
Via RS-232 and RS-485 interface for direct connection to a PC or for connecting to an Ethernet network via converters. Special software for Windows for documentation of all process flow data such as pressure, temperature, time, and sterilization phase including relevant diagrams. The Systec ADS documentation software processes documented data both graphically and numerically.

Options for documentation

VX VE DX DE

SD card for batch documentation*
Extensive documentation on up to 10,000 sterilization cycles* via an (optional) integrated card slot and a 1024 MB SD memory card (included). All the recorded data is available, via the SD memory card, for processing with the Systec ADS documentation software package.

* only in conjunction with optional Systec ADS software.

VX

Systec ADS CFR documentation software package with conformity to FDA 21 CFR Part 11
Optional documentation for Systec VX models (starting from 65 litre chamber volume) in conjunction with the optional touch-screen display. Download of the process flow and audit trail data from the autoclave. This solution ensures documentation according to the provisions of the FDA 21 CFR Part 11. The Systec ADS documentation software with conformity to FDA 21 CFR Part 11 processes the documented data, both graphically and numerically.

21 CFR part 11

AuditTrail
AuditTrail allows you to set up and administer the users of the autoclave. You can specify which user can perform which actions on five different authorization levels. In addition, the access rights for the stored sterilization programs can be specified individually. The user must log in with a username and password before each action. All the actions carried out (e.g. the changing of parameters, or the starting or stopping of sterilization programs) are documented and can be traced back to the user responsible, and can also be identified by a timestamp (date and time). All the data generated by the user's actions or by the documentation of a sterilization cycle are protected against manipulation and marked with the electronic signature of the respective user.

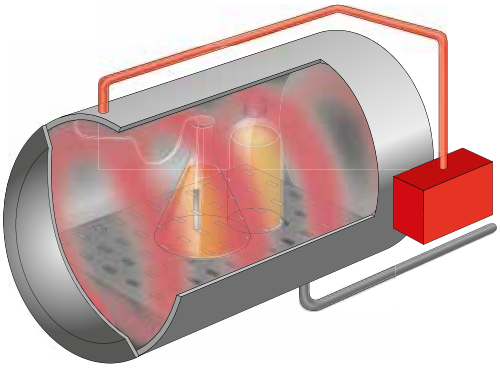
Sterilization of liquids.

Heating up

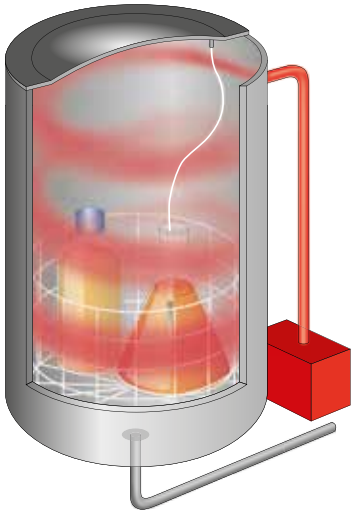
The actual sterilization time of e.g. 15 minutes at 121 °C is only a fraction of the total time involved for an autoclave procedure. Especially in the case of sterilizing liquids, the heating up and cooling down phases are considerably longer.

The conventional procedure
In previously used conventional systems, even if the intended sterilization temperature has been reached within the autoclave, the liquids to be sterilized are often only at about 60-90 °C; the temperature equilibrium time between chamber and liquids normally takes much longer.

Up to 50 % shorter heat-up times as standard
Due to the combined temperature and pressure regulation, the chamber pressure is increased during the heat-up phase. The result: more rapid temperature equilibrium in the liquids and a shorter heat-up time.



Systec D-Series



Systec V-Series

Cooling

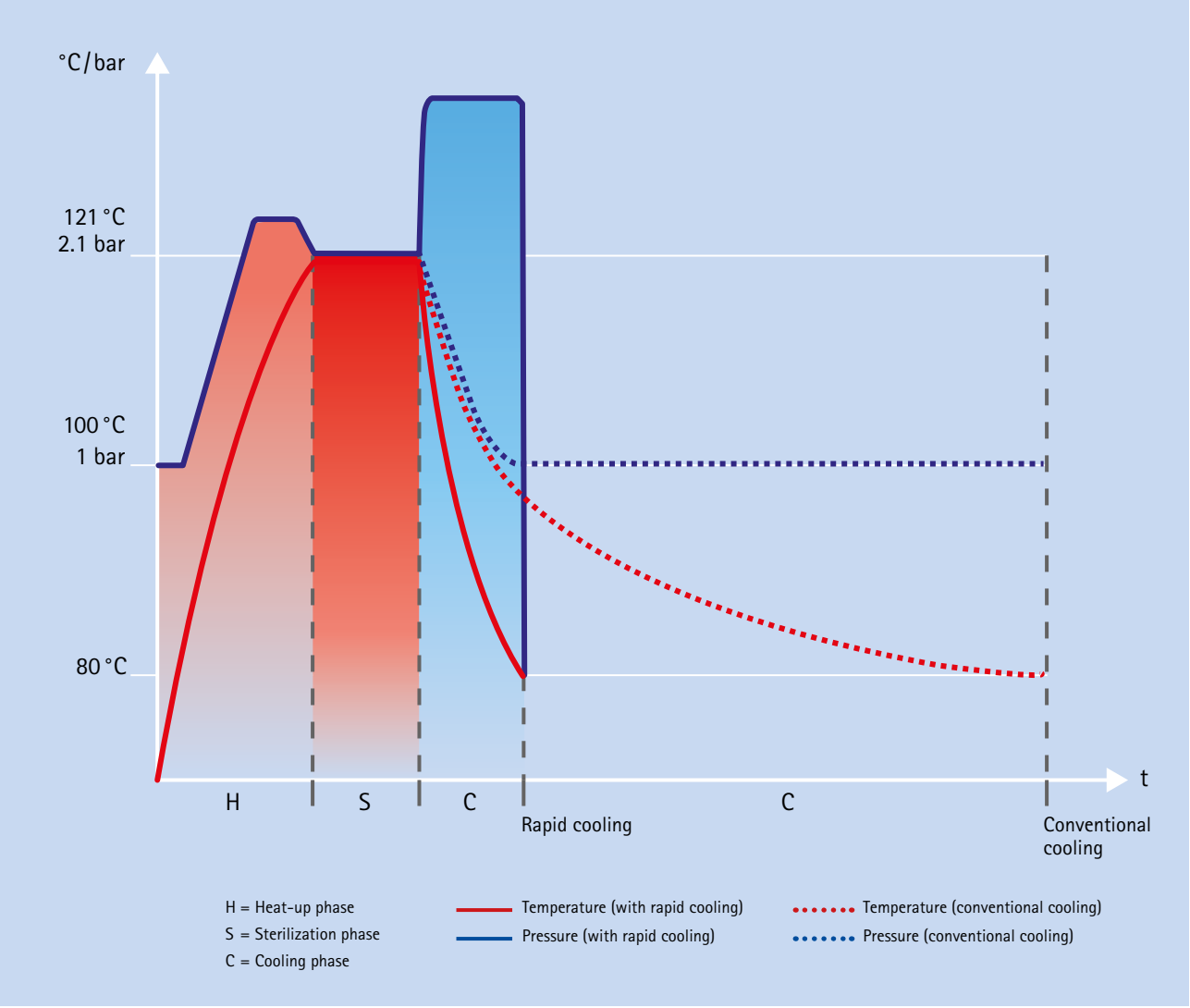
The cooling process for liquids is also very slow; this is because, without active rapid cooling, the heat can only be reduced to below 100°C by dissipating the heat via the chamber insulation by radiation (see diagram: conventional cooling).

New system- and process technology now make it possible to substantially reduce the overall time required for the sterilization process. This means that several hours of time can be saved! It also means that the media is not exposed to heat unnecessarily long time (see diagram: rapid cooling).

Systec offers many functions for its autoclaves guaranteeing safe liquid sterilization processes at higher productivity. Many of these functions are standard or available as options depending on the model range selected.

Standard functions in all models
- Temperature- and pressure-dependent door locking in line with international standards and regulations.
- Redundant process control; temperature and pressure are continuously monitored and controlled during the entire sterilization cycle.
- Rapid heat-up via optimized heat transfer to the liquid media.
- Flexible PT-100 temperature sensor for temperature measurement in a reference vessel:
  - Guarantees attainment of the desired sterilization temperature in the liquid media.
  - Guarantees cooling of the liquid media to a temperature that is safe for removal.

Overview Conventional cooling / Rapid cooling



The times given in the diagrams are dependent on the number and size of the items to be sterilized.

Sterilization of liquids.

Cooling

VX VE DX DE

Systec supplies autoclaves guaranteeing precise sterilization processes, safe handling and increased productivity. Numerous cooling functions are available for liquid sterilization.

Various optional rapid cooling systems enable the cooling times for liquids to be significantly reduced. This conserves culture media and makes for efficient utilization of the autoclave.

In addition to conventional cooling by regulated steam exhaust down to 100 °C and subsequent very slow self-cooling down to 80 °C, optional cooling systems for rapid cooling are available.

- Cooling with ambient air ventilation
- Mantle cooling with cooling water
- Mantle cooling with cooling water and support pressure
- Radial ventilator for air circulation and accelerated heat removal from the chamber
- Ultracooler
- Spray cooling with recirculated and recooled sterile water and support pressure

Mantle cooling with cooling water and support pressure

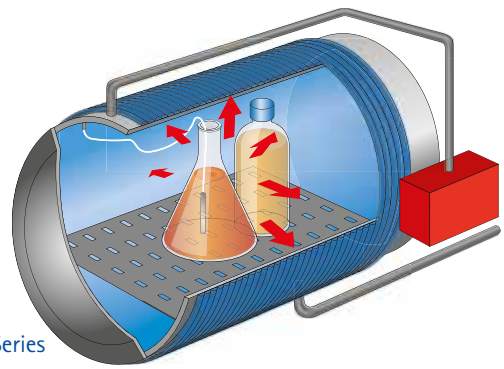
VX VE DX DE

Permanently under control
During the entire sterilization process a flexible PT-100 temperature sensor monitors the temperature in a reference vessel. It is thus guaranteed that the sterilization period begins only once the sterilization temperature has been attained in the liquid to be sterilized.

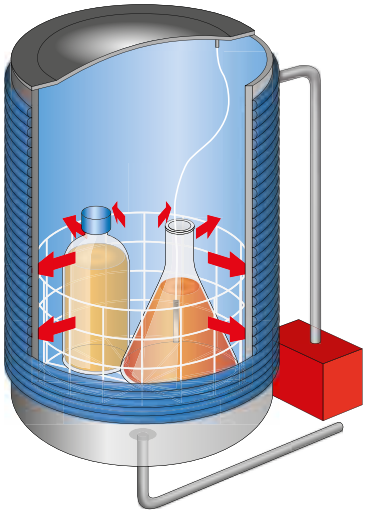
The cooling temperature is also constantly monitored. In accordance with relevant standards to prevent delayed boiling, the lid can only be opened once the temperature of the liquid has been reduced to at least 80 °C.

The use of support pressure in the form of sterile-filtered compressed air during the cooling phase reliably prevents the culture medium from boiling.

Advantages
- No loss of liquid due to boiling of the culture media
- Improved productivity from reduced cycle times and the full utilization of the filling volume in each bottle
- Prevention of delayed and over-boiling
- Prevention of the risk of bottles bursting during or after sterilization
- Prevention of re-contamination by the use of hermetically sealed bottles during sterilization
- Reduction of cooling time by up to 60 %



Systec D-Series



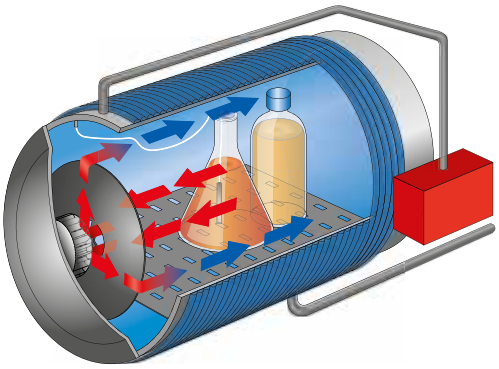
Systec V-Series

Radial Ventilator

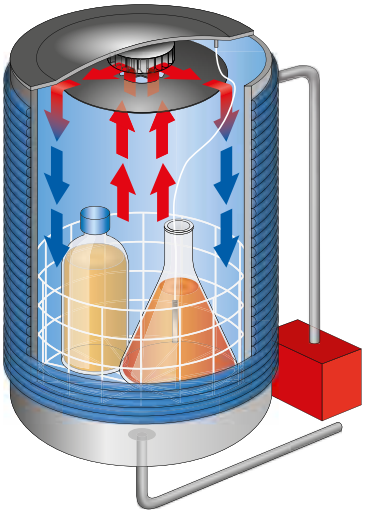
VX VE DX DE

In conjunction with optional mantle cooling with cooling water and support pressure, the radial ventilator ensures accelerated removal of heat from the sterilization items to the cooled chamber mantle. The radial ventilator is driven by a magnetic motor fitted outside under the cover.

- The radial ventilator is placed in the lid of the chamber so that the usable space in the autoclave is not reduced!
- Ventilation performance 71 m^3/h
- Reduction of cooling time by up to 70 %



Systec D-Series



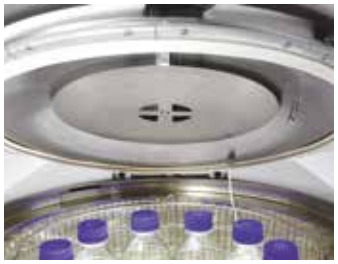
Systec V-Series

Ultracooler

VX VE DX DE

In conjunction with optional mantle cooling with cooling water, support pressure and radial ventilator, it is possible to significantly reduce the recooling time and the entire sterilization process by integrating of the additional ultracooler heat exchanger.

- The ultracooler is also placed in the lid of the chamber near the radial ventilator so that the usable space in the autoclave is not reduced. This way, the entire interior space can be used for full loading!
- Reduction of cooling time by up to 90 %
- Depending on the load, cooling times between 15 and 60 minutes can be achieved



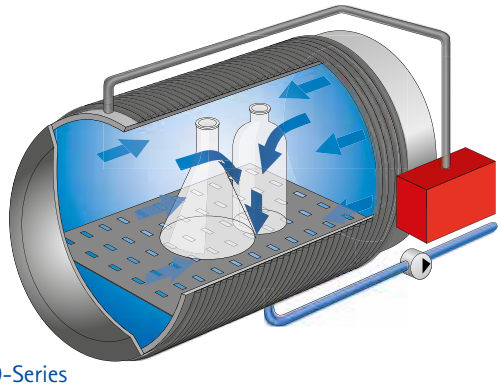
Sterilization of solids and waste in disposal bags.

Vacuum system

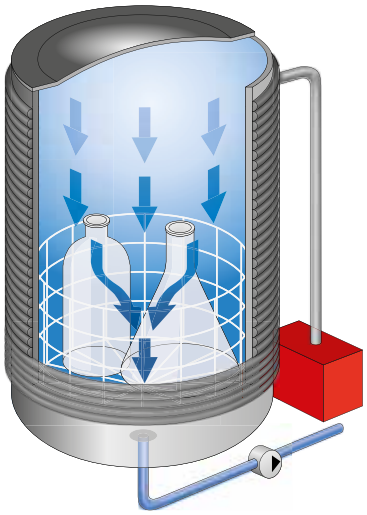
VX DX

Typical solids are pipette tips (in boxes), empty glassware and waste in bags as wall as porous materials such as filters or fabrics. For this type of sterilization, it is important to remove all air from the products to be sterilized to ensure precise, reproducible and validatable sterilization.

The vacuum device effectively removes the air from solids, tubing, porous materials, fabrics and disposal bags, allowing the steam to penetrate completely. The process includes a fractionated pre-vacuum phase in combination with the standard steam generator. This is the only way to achieve validatable sterilization of porous materials, solids, fabrics or waste in bags.



Systec D-Series

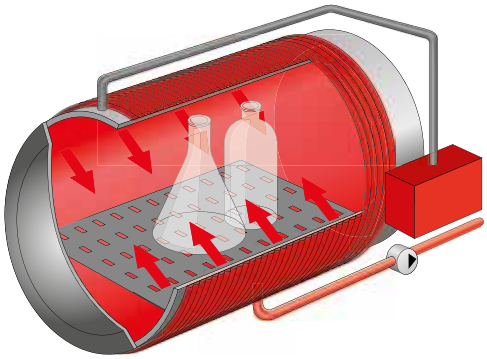


Systec V-Series

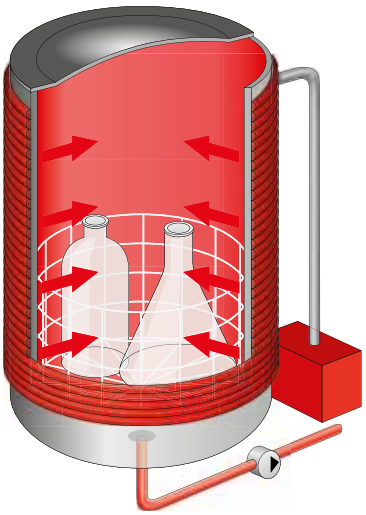
Superdry – for drying solids

VX DX

This optional accessory increases the drying efficiency for solids and porous materials such as filters and fabrics. Heat energy from the standard steam generator is transferred to the heating coils around the body of the sterilization chamber and is used for drying. Deep-vacuum drying using the optional vacuum device in conjuction with Superdry avoids the necessity for subsequent drying in a separate drying cabinet.



Systec D-Series



Systec V-Series

Sterilization of hazardous biological substances.

Permanently monitored – exhaust air filtration with condensate inactivation

For the sterilization of hazardous biological substances, Systec autoclaves can be fitted with an optional air exhaust filtration system.

The autoclavable sterile filter, consisting of a filter cartridge with PTFE membrane of pore size 0.2 µm, is installed in a presure-proof housing and can be quickly changed at any time. The filter is also automatically sterilized inline during the sterilization process, monitored by the PT-100 temperature sensor.

The condensate is retained inside the pressure vessel during the heating and sterilization phases and thus also sterilized. Through air exhaust filtration and condensate inactivation, it is ensured that no microorganisms can escape before end of the sterilization phase.

This ensures that all gases and liquids representing a hazard if they were to be released into the atmosphere are filtered and sterilized in-line.

Important note for effective sterilization.

Select the right process for every sterilization application: As already described, several options are available that are necessary to obtain correct and validatable results and rapid cooling times, especially in the case of liquids. The options available depend on the items to be sterilized. It is therefore important to think carefully about your requirements so that the autoclave can be optimally configured for the necessary tasks.

A validatable sterilization process of biological efficiency can only be obtained if the correct instrument configuration is used. The table below provides help in establishing the desired configuration; however, we recommend obtaining additional advice from our experts.

Procedure:	**Ventilation**				**Cooling**		**Drying**		**Other**
	Gravitation	Simple pre-vacuum	Pulsed excess pressure	Fractionated pre-vacuum	Conventional cooling with slow pressure release	Rapid cooling system with support pressure	Surface drying without vacuum	Drying with subsequent vacuum + Superdry	Exhaust air filtration
Applications:									
Liquids	+	?	-	-	?	+	?	-	
Unpacked non hollow items	+	+	+	+			?	+	
Porous materials (filters, fabrics)	-	?	?	+			-	+	
Hollow items (pipette tips, empty glassware, tubes and hoses)	-	-	-	+			-	+	
Contaminated waste in destruction bags	-	-	?	+			-	-	+

+ Recommended procedure ? Possibly acceptable - Not possible

System accessories for ease of handling.

Vertical floor-standing autoclaves Systec V-Series

Lifting device for heavy items
The electrically operated device with swivel arm facilitates the loading and unloading of heavy items. A mobile control panel with push-button operation makes for ease of use.

The device is attached to the side of the autoclave. The swivel arm has a special grip for the baskets that remain stable even under loading conditions.

Loading baskets and inserts

Stainless steel wire mesh baskets, stackable

Baskets Art. No.	Intern. dimen. Ø x H (mm)	Extern. dimen Ø x H (mm)	Capacity per autoclave: V-40	V-55	V-65	V-75	V-95	V-100	V-120	V-150
1654	305 x 192	315 x 200	2							
1655	305 x 282	315 x 290	1	2						
7215	360 x 232	370 x 240			2		3			
7212	360 x 282	370 x 290				2				
7210	360 x 357	370 x 365			1	1	2			
7225	460 x 232	470 x 240						2		3
7222	460 x 282	470 x 290							2	
7220	460 x 357	470 x 365						1	1	2

Stainless steel basket perforated only in upper third, sealed bottom for waste sterilization

Art. No.	Intern. dimen. Ø x H (mm)	Capacity per autoclave: V-40	V-55	V-65	V-75	V-95	V-100	V-120	V-150
1657	325 x 385	1	1						
7230	350 x 355			1	1	2			
7235	465 x 355						1	1	2

Stainless steel basket perforated only in upper third, sealed bottom for waste sterilization, with swivel lid

Art. No.	Intern. dimen. Ø x H (mm)	Capacity per autoclave: V-40	V-55	V-65	V-75	V-95	V-100	V-120	V-150
7240	345 x 270			1	2	2			
7245	450 x 350						1	1	2

Loading capacities may vary option-dependent.
Different sizes of flasks and bottles may vary the loading capacities.

System accessories for ease of handling.

Horizontal bench-top autoclaves Systec D-Series

Support Tables
There is a special bench for each of the Systec D-Series autoclaves. These are custom-dimensioned for the instrument in question. The benches are 72 cm high (other heights available at no extra charge) and make for ease of handling. They have a practical shelf e.g. for storing baskets etc.

Transport and loading trolley
Large autoclaves in particular can be easily and securely loaded using a special loading trolley. The items to be sterilized can either be placed directly on the sliding platform of the trolley or using a basket. The trolley can now be moved and docked to the autoclave and fixed in position. The handle can then be loosened to allow the platform to slide into the autoclave on fixed rails.

Loading shelves
To fully utilize the available space in the chamber, especially when sterilizing small items, the autoclaves can be fitted with loading shelves. The entire shelving system or individual trays can be removed.

Stainless steel quality
All parts are made of stainless steel and cleanly welded. Bench-top autoclaves are fitted with adjustable leveling screws to ensure stability. The transport trolleys have large rollers, two of them fitted with brakes, to ensure smooth running.

Loading baskets and inserts

Stainless steel wire mesh baskets, stackable

Baskets Art. No.	Intern. dimen. LxWxH (mm)	Extern. dimen. LxBxH (mm)	Capacity per autoclave: D-23	D-45	D-65	D-90	D-100	D-150	D-200
1552	390 x 170 x 131	400 x 180 x 140	1						
1553	490 x 260 x 176	500 x 270 x 185		1					
4072	490 x 310 x 211	500 x 320 x 220			1				
5074	690 x 310 x 211	700 x 320 x 220				1			
6071	490 x 360 x 291	500 x 370 x 300					1		2
6072	490 x 360 x 141	500 x 370 x 150					2		4
7071	360 x 360 x 291	370 x 370 x 300						2	
7072	740 x 360 x 291	750 x 370 x 300						1	
7075	360 x 360 x 141	370 x 370 x 150						4	
7076	740 x 360 x 141	750 x 370 x 150						2	

Stainless steel tub for waste sterilization

Art. No.	Intern. dim. LxWxH (mm)	Capacity per autoclave: D-23	D-45	D-65	D-90	D-100	D-150	D-200
1554	395 x 180 x 135	1						
1555	495 x 265 x 180		1					
4073	495 x 318 x 219			1				
5075	696 x 318 x 219				1			
6070	495 x 368 x 300					1		2
7070	368 x 368 x 300						2	
7073	747 x 368 x 300						1	

Loading capacities may vary option-dependent. Different sizes of flasks and bottles may vary the loading capacities.

Custom developments for special applications.

Additional features and programs

For example for the food industry for the sterilization of liquids in closed vessels, plastic bottles, bags, cans, blister packs and food packs, e.g.:

- Devices and programs for sterilization in a steam/air mixture
- Devices and programs for sterilization with hot water spraying and spray-cooling

Custom constructions for individual tasks

Development and construction of modified systems such as:

- Autoclaves in dual system
- Autoclaves for environmental simulation with programs for up to 99 days of testing for:
  - Generation of steam and heat
  - Generation of pressure and heat
  - Heating up and cooling down in repetitive mode
  - Heating up and cooling in ramps

Detailed information on customized design available on request.

Test autoclaves are at your disposal in our test laboratory for the evaluation of your process parameters.

Quality performance.

Product related activities:
- Development
- Design
- Production of series products
- Production of custom products
- Application and technical advice

Additional services:
- Installation and start-up
- Special technical developments
- Tests and process development
- Individual service on-call
- Contract service
- Qualification and validation
- GMP-compliant documentation
- Consultancy on sterilization processes and special requirements
- Process development

Qualification and validation
Within the scope of our service we offer you qualification and validation work with GMP-compliant documentation:
- DQ – Design Qualification
  – Definition of requirements regarding the autoclave with respect to process technology
- IQ – Installation Qualification
  – The autoclave is manufactured and installed according to the defined DQ requirements
- OQ – Operation Qualification
  – The autoclave to function as specified in DQ
- PQ – Performance Qualification
  – The autoclave sterilizes the product permanently according to pre-defined specifications

Quality Assurance according to ISO 9001
Our Quality Management is such that it complies with the most stringent requirements of testing and documentation.

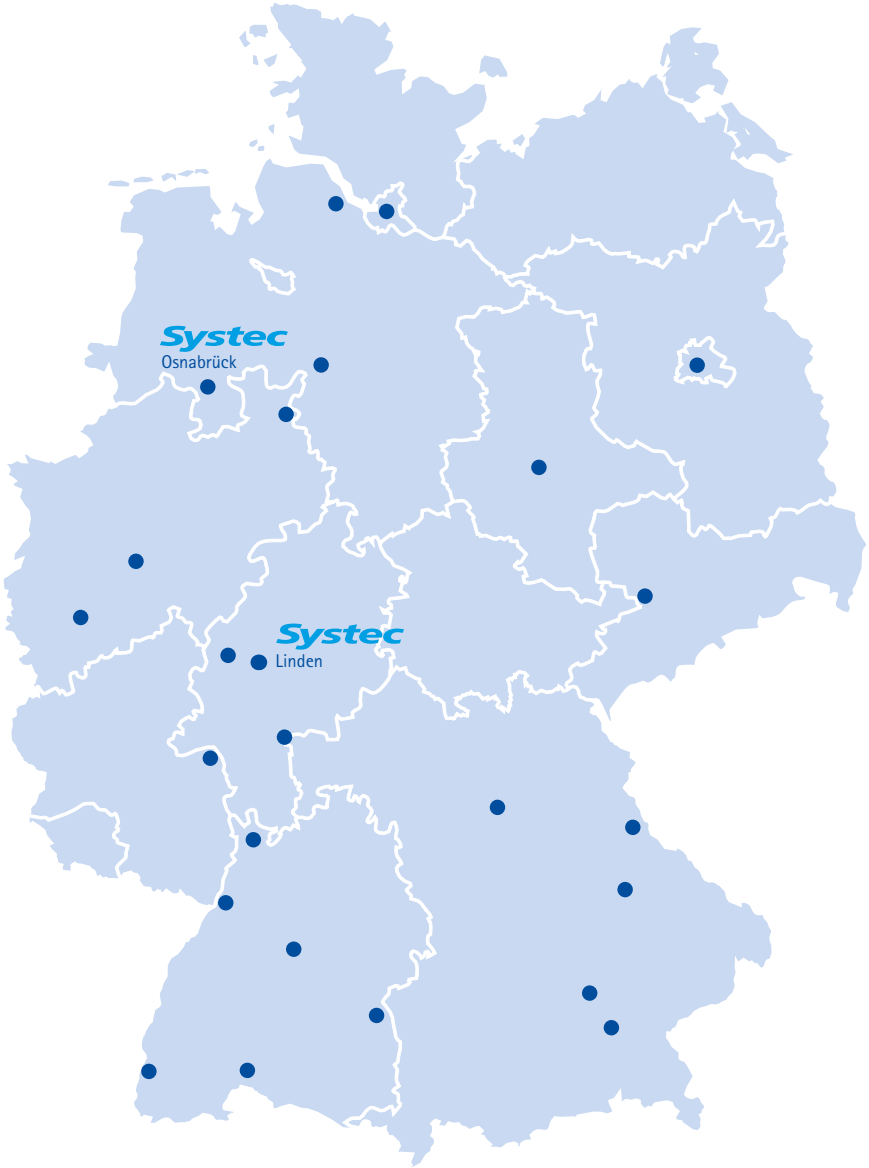
Each component is subject to exhaustive control and each autoclave is checked and tested for all functions before delivery. A Certificate of Acceptance is provided.

Our environmental management system according to ISO 14001
In addition, our environmental management system is certified according to DIN EN ISO 14001. We are happy to provide our customers with details of our environmental policy upon request. A Certificate of Acceptance is provided.

Sales and service in Germany.

Systec service stations in Germany

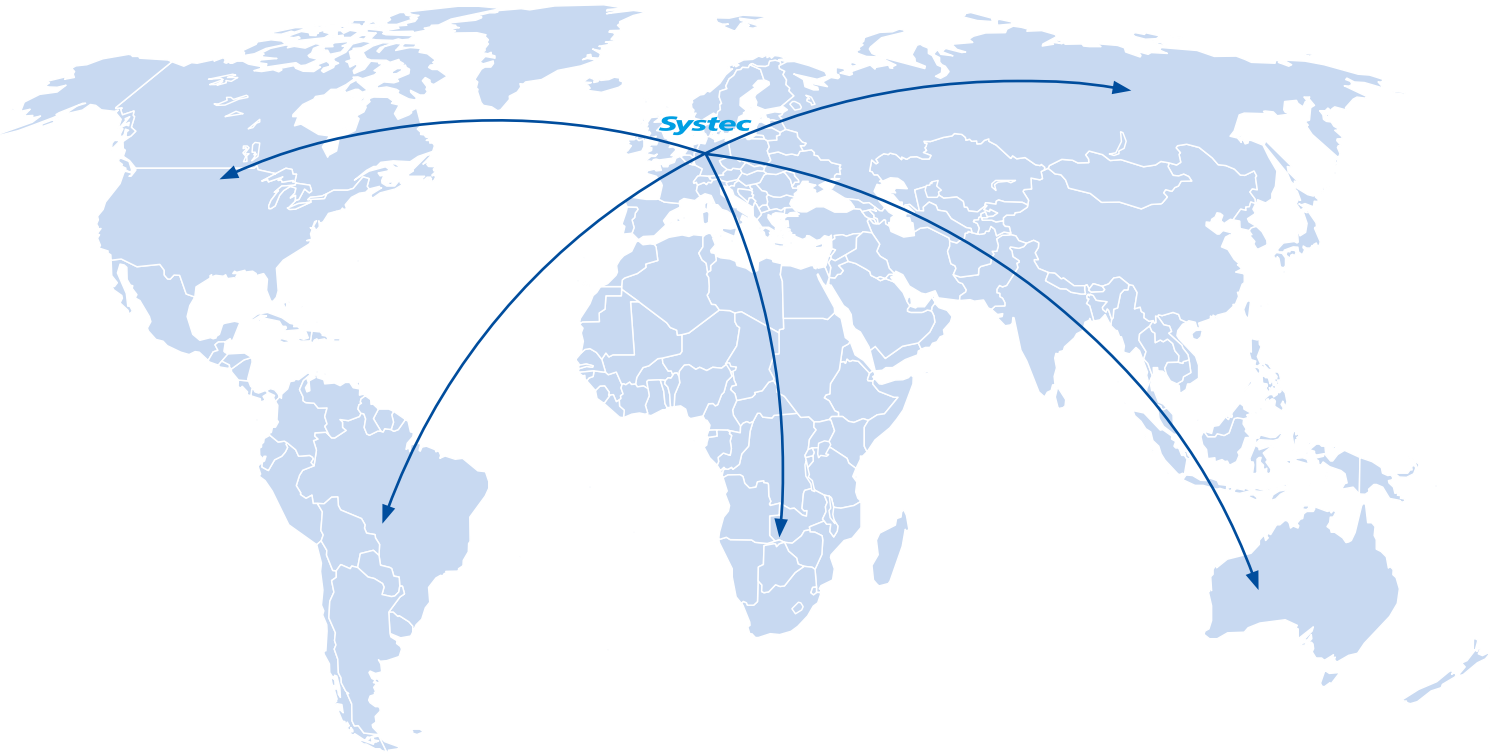
A Systec service technician is always near you and can be contacted at any time through our central service number: +49 6403 67070-0



Sales and service.

Worldwide via trained partners.

Systec laboratory autoclaves and Systec media preparators are performing reliably in numerous countries on every continent. Our qualified partners are available to you for consulting, sales and service.



Complete program.

Autoclaves.

Autoclaves as horizontal or vertical construction. Pass-through autoclaves for wall recessing in safety areas (e.g. biological safety laboratories or clean rooms).

- Vertical floor-standing autoclaves
  Systec V-Series
  40 to 150 liters

- Horizontal bench-top autoclaves
  Systec D-Series
  23 to 200 liters

- Horizontal floor-standing autoclaves
  Systec H-Series
  65 to 1580 liters

- Pass-through autoclaves
  Systec H-Series 2D
  90 to 1580 liters

Prepare, sterilize and dispense culture media.

Systems for the preparation and sterilization of microbiological culture media and for the automatic filling of Petri dishes, bi-plates, tri-plates and test tubes.

- Media preparators
  Systec Mediaprep
  10 to 120 liters

- Plate pourer and tube filler
  Systec Mediafill

Systec
the autoclave company

MADE IN GERMANY

Headquarter Germany:
Systec GmbH
Konrad-Adenauer-Straße 15
35440 Linden, Deutschland
T +49 6403 67070-0
F +49 6403 67070-222
info@systec-lab.de
www.systec-lab.de

Subsidiary Switzerland:
Systec Schweiz GmbH
Gewerbestrasse 8
CH-6330 Cham, Switzerland
T +41 41 781 52 80
F +41 41 781 52 79
info@systec-lab.ch
www.systec-lab.ch

Subsidiary China:
Systec (Shanghai) trading co., ltd
C1-206, No.6000 Shenzhuan Rd.
Songjiang 201619
Shanghai, China
T +86 21 6019 0256
info@systec-lab.com.cn
www.systec-lab.com.cn