



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Solicitation

NUMBER
AGR1427

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF
DEAN WINGERD 304-558-0468

RFQ COPY

TYPE NAME/ADDRESS HERE

Microbiology International
 5111 Pegasus CT/Suite H
 Frederick, MD 21704

S
H
I
P
T
O

DEPARTMENT OF AGRICULTURE
 JOBSITE
 SEE SPECIFICATIONS

DATE PRINTED
04/30/2014

BID OPENING DATE: 05/22/2014

BID OPENING TIME 1:30PM

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	LS		465-90	\$79,950. ⁰⁰	\$79,950. ⁰⁰
GRAVITY AND VACUUM STEAM STERILIZER <i>Quoting system HX 320</i>						
THE WEST VIRGINIA PURCHASING DIVISION FOR THE AGENCY, WV DEPARTMENT OF AGRICULTURE, IS SOLICITING BIDS FOR THE ONE-TIME PURCHASE OF A GETINGE 533LS GRAVITY AND VACUUM STEAM STERILIZER OR EQUAL, PER THE ATTACHED SPECIFICATIONS.						
ATTACHMENTS INCLUDE:						
<ol style="list-style-type: none"> 1. INSTRUCTIONS TO VENDORS SUBMITTING BIDS. 2. GENERAL TERMS AND CONDITIONS. 3. AGR1427 SPECIFICATIONS. 4. CERTIFICATION AND SIGNATURE PAGE. 5. PURCHASING AFFIDAVIT. 6. VENDOR PREFERENCE FORM. 						
THE MODEL/BRAND/SPECIFICATIONS NAMED HEREIN ESTABLISH THE ACCEPTABLE LEVEL OF QUALITY ONLY AND ARE NOT INTENDED TO REFLECT A PREFERENCE OR FAVOR ANY PARTICULAR BRAND OR VENDOR. VENDORS WHO ARE BIDDING ALTERNATES SHOULD SO STATE AND INCLUDE PERTINENT LITERATURE AND SPECIFICATIONS. FAILURE TO PROVIDE INFORMATION FOR ANY ALTERNATES MAY BE GROUNDS FOR REJECTION OF THE BID. THE STATE RESERVES THE RIGHT TO WAIVE MINOR IRREGULARITIES IN BIDS OR SPECIFICATIONS IN ACCORDANCE WITH SECTION 148-1-4(F) OF THE WEST VIRGINIA LEGISLATIVE RULES AND REGULATIONS.						
05/19/14 09:54:31AM West Virginia Purchasing Division						

SIGNATURE <i>Jason P. Coyle</i>	TELEPHONE 800-396-4276	DATE 05-15-2014
TITLE National Sales Manager	FEIN 30-0208596	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO SOLICITATION, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

AGR1427

PRICING PAGE

Item No.	Description	Model No/Brand Name	Quantity	Unit Price	Extended Amount
	Getinge 533LS Gravity and Vacuum Steam sterilizer or equivalent - <i>Quoting SysTec HX 320</i>	<i>SysTec HX 320</i>	1	<i>79,950.⁰⁰</i>	<i>\$ 79,950.⁰⁰</i>
	<i>Microbiology International</i>				
	<i>Quotation # 12180 attached</i>				
	<i>includes installation & training</i>				
	Failure to use this form may result in disqualification			GRAND TOTAL	<i>\$ 79,950.⁰⁰</i>
Bidder / Vendor Information					
Name:	<i>Microbiology International</i>				
Address:	<i>5111 Pegasus Ct., Ste. H</i>				
	<i>Frederick, MD 21704</i>				
Phone:	<i>800-396-4276</i>				
Email Address:	<i>jason.cadje@800ezmicro.com</i>				
Authorized Signature:	<i>Jason P. L. Corle</i>				

K&R Technologies dba



Microbiology INTERNATIONAL

Global Innovation • Superior Support

Prepared for: **West Virginia Dept. Agriculture**
Solicitation #AGR1427

Quotation Expires on: 06/22/14

Credit Cards Accepted
Terms: *1.00%-10/Net 30
F.O.B. Destination
Delivery in 6-12 Weeks
ID Number: W00089

Quotation

Quotation No.: 12180
Date of Quotation: 05/15/14

Quantity	Item Number	Description	Unit Price	Amount
		Response to Solicitation AGR1427:		
1	23-E091	Systec HX-320 Autoclave 320 liters, 740 x 750 mm chamber dimension	65583.00	65583.00
1	23-A205	Vacuum System for HX models	11469.00	11469.00
1	23-A234	Quick Cooling with compressed air for HX210 & HX320	7638.00	7638.00
1	23-A001	ADS PC software for Systec MP and Autoclaves.	0.00	0.00
1	23-A192	Loading Carriage for HX-320 Autoclave	5268.00	5268.00
1	23-A188	Transport Carriage for HX-320 autoclave	5092.00	5092.00
1	99-I103	Installation & Training	1495.00	1495.00
1		One year warranty includes parts and labor	0.00	0.00
		Fed. ID# 30-0208596 DUNS# 005066480		
		Quote subtotal		96545.00
		Discount		-16595.00
		Quote total		79950.00

Quotation Authorized by: Jason Cadle, Senior Sales Representative

Please Fax Orders to 301-662-8096

Microbiology International

5111 Pegasus Court, Suite H, Frederick, MD 21704

Tel: 800-396-4276

Fax: 301-662-8096

www.800ezmicro.com



Microbiology INTERNATIONAL

Global Innovation • Superior Support

Microbiology International is the sole distributor in the United States for Systec Autoclaves and related accessories. This system is not available through any other manufacturer, dealer, distributor, or representative in the United States or Canada. Questions regarding this matter should be directed to our corporate office at 301-662-6835.

Response to Solicitation Number AGR1427:

Microbiology International is offering a Systec HX-320 Autoclaves for Solicitation Number AGR1427. This system meets or exceeds all “Mandatory Desired Item Requirements” detailed within the GENERAL REQUIREMENTS section as noted below.

3.1 Mandatory Desired Item Requirements:

3.1.1 Systec HX-320 Autoclave with options ideal for all cycle types.

3.1.1.1 The Systec HX-320 Autoclave steam sterilizer utilizes an internally housed steam generator for downward displacement of air within the chamber. The autoclave utilizes three pulses; with vacuum cycle between each pulse to ensure that all air has been displaced, creating a 100% steam environment. Strict adherence to the steam temperature/pressure table ensures that all cycles are only done within a 100% steam environment. This unit is capable of reaching and maintaining 140°C and 4 bar of pressure for 9999 minutes. **EXCEEDS REQUIREMENTS**

3.1.1.2 The Systec HX-320 Autoclave boasts a myriad of safety features. Just a few of them are listed below. **EXCEEDS REQUIREMENTS**

- When the door is closed, it is automatically locked by a circumferential ring system. A special lip seal made of heat resistant silicone provides reliable sealing. As steam pressure builds the seal becomes tighter. The door-locking system is temperature dependent and adheres to national and international safety standards. The door remains locked as long as there is excess pressure in the chamber. The automatic closing mechanism ensures perfect sealing every time preventing user to user variability. In addition to reducing variability the Systec HX320 does not rely on a sliding steam operated door which has shown to be a source of field related issues with certain autoclaves.
- The door, like other parts of the pressure vessel and housing, is made of stainless steel. The modern design faceplate, which also contains the control panel, display and touchscreen interface, is made of heat resistant and insulated plastic. There is no risk of the operator coming into contact with hot surfaces.

- Systec autoclaves include, as standard, a flexible temperature probe inside of the system that will allow for insertion into a reference vessel. This is unique to our systems. In any system that does not have a probe, it is purely guess work as to what temperature the liquids will reach. With Systec there is no guesswork. This is an important safety feature because without a probe inserted into the media, you can never be sure of the actual temperature of the media. Once liquids get to 121°C, autoclaves without a probe inserted into the flask could potentially allow you to open that autoclave while the liquids are still above boiling. Upon opening of the autoclave, the pressure will be released and you could potentially have a serious safety issue as the operator can come into contact with boiling or superheated liquids.
- The Systec HX-320 vessel is ASME certified for safety. Systec autoclaves go through the most rigorous QC and QA processes. They are certified for both European and for North American use. Our rigorous internal QC program includes calibration of all temperature and pressure probes traceable to NIST standards.
- The Systec HX-320 circular internal chamber is significantly safer than square chambers. A circular chamber is structurally more rigid and stronger than a rectangular chamber, as they have no corners or weak spots that could potentially fail under the high pressures.

3.1.1.3 The Systec HX-320 Autoclave utilizes a single door that automatically locks by a circumferential ring system. This ensures standardized and ideal closing of the door every time, with no variability from user to user. The door defaults to the locked positions in the event of power loss as an additional safety feature.

EXCEEDS REQUIREMENTS

3.1.1.4 The Systec HX-320 is fully controlled by a microprocessor and LCD Touch Screen housed on the front of the unit. The user-friendly and intuitive design makes utilization of the unit extremely easy. All cycle parameters, service and functions of the autoclave are controlled via this touchscreen. All units can be put into English, Spanish, French, German and Chinese. ADS software will be provided at no additional charge for documentation of all cycle parameters. **EXCEEDS**

REQUIREMENTS

3.1.1.5 The external footprint of the Systec HX-320 is 36.6" x 50.6" x 70" WxDxH. This external footprint is less than the Getinge 533LS, but the Systec HX-320 offers 320L of internal space for sterilization as opposed to the Getinge 533LS' 275L. Not only does the Systec HX-320 offer more sterilization volume in a smaller footprint, but it also weighs only 893lbs as opposed to Getinge's 1500lbs. This is important from an efficiency standpoint. There is an additional 700lbs of steel that must be heated up and then cooled in the Getinge unit for each cycle. This inefficiency is compounded by the fact that Getinge uses a square chamber. The corners of a rectangular chamber are common areas for trapped air pockets which compromise the 100% steam atmosphere necessary for correct

sterilization. The Systec HX-320 round chamber eliminates the possibility of these corner-trapped air pockets and provide even more hidden benefits. A circular chamber insures a consistent temperature and pressure throughout the chamber, which provides reproducible cycles. Also, a round chamber is structurally more rigid and stronger than a rectangular chamber; the stronger chamber is created with less material for a faster and more efficient thermal transfer, which reduces cycle times. **EXCEEDS REQUIREMENTS**

5.1.1.6 The Systec HX-320 utilizes only one power source to run both the unit and the internally housed steam generator: 3 phase, 230V, 60 Hertz power. The Getinge unit requires two power sources: a 120V for the unit and a 230V for the external steam generator. **EXCEEDS REQUIREMENTS**

5.1.1.7 All vacuum source, steam piping, and valves within the Systec HX-320 are copper or brass. **MEETS REQUIREMENTS**

5.1.1.8 The Systec HX-320 utilizes an internally housed 18kW steam generator that is composed of high quality, electro-polished AISI 316 Ti stainless steel. DI water is automatically fed into the generator so that steam is always on demand. The Systec HX-320 is able to produce faster heat up times than the Getinge because of the difference in chamber design. The added thickness and inefficient design of a rectangle or square chamber requires more time and energy to heat; while the circular chamber design of the HX-320 allows the unit to heat up faster with less power consumption. **EXCEEDS REQUIREMENTS**

5.1.1.9 The Systec HX-320 pressure vessel is certified by American Society of Mechanical Engineers (ASME) and the unit is delivered calibrated to National Institute of Standards and Technology (NIST) traceable standards. The unit boasts the aforementioned safety features and includes alerts for water, temperature, pressure and mechanical errors.

5.1.1.10 The Systec HX-320 will include a Loading Carriage which easily slides onto an interior track within the unit. This provides easy loading and unloading of items into and out of the autoclave. **MEETS REQUIREMENTS**

5.1.1.11 The Systec HX-320 will include a Transport Trolley on which the Loading Carriage can be transported. The Transport Trolley is pre-measured to the exact height needed, so that the Loading Carriage lines up with the internal track within the autoclave. This provides extremely fast and easy loading and unloading of the unit. **EXCEEDS REQUIREMENTS**

CERTIFICATION AND SIGNATURE PAGE

By signing below, I certify that I have reviewed this Solicitation in its entirety, understand the requirements, terms and conditions, and other information contained herein; that I am submitting this bid or proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

Microbiology International
(Company)

Jason P. L. Cadle
(Authorized Signature)

Jason Cadle, National Sales Manager
(Representative Name, Title)

800-396-4276 301-662-8096
(Phone Number) (Fax Number)

05-15-2014
(Date)

State of West Virginia

VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with West Virginia Code, §5A-3-37. (Does not apply to construction contracts). West Virginia Code, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the West Virginia Code. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Vendor Preference, if applicable.

- 1. Application is made for 2.5% vendor preference for the reason checked: Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or, Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or, Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,
2. Application is made for 2.5% vendor preference for the reason checked: Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
3. Application is made for 2.5% vendor preference for the reason checked: Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
4. Application is made for 5% vendor preference for the reason checked: Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,
5. Application is made for 3.5% vendor preference who is a veteran for the reason checked: Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,
6. Application is made for 3.5% vendor preference who is a veteran for the reason checked: Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.
7. Application is made for preference as a non-resident small, women- and minority-owned business, in accordance with West Virginia Code §5A-3-59 and West Virginia Code of State Rules. Bidder has been or expects to be approved prior to contract award by the Purchasing Division as a certified small, women- and minority-owned business.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: Microbiology International

Signed: Joan P. Cook

Date: 05-15-2014

Title: National Sales Manager

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

MANDATE: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (W. Va. Code §61-5-3) that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: Microbiology International

Authorized Signature: Jason P. L. Coole Date: 14 MAY 2014

State of Maryland

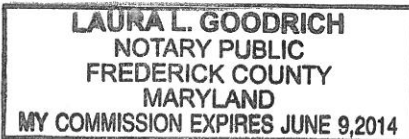
County of Frederick, to-wit:

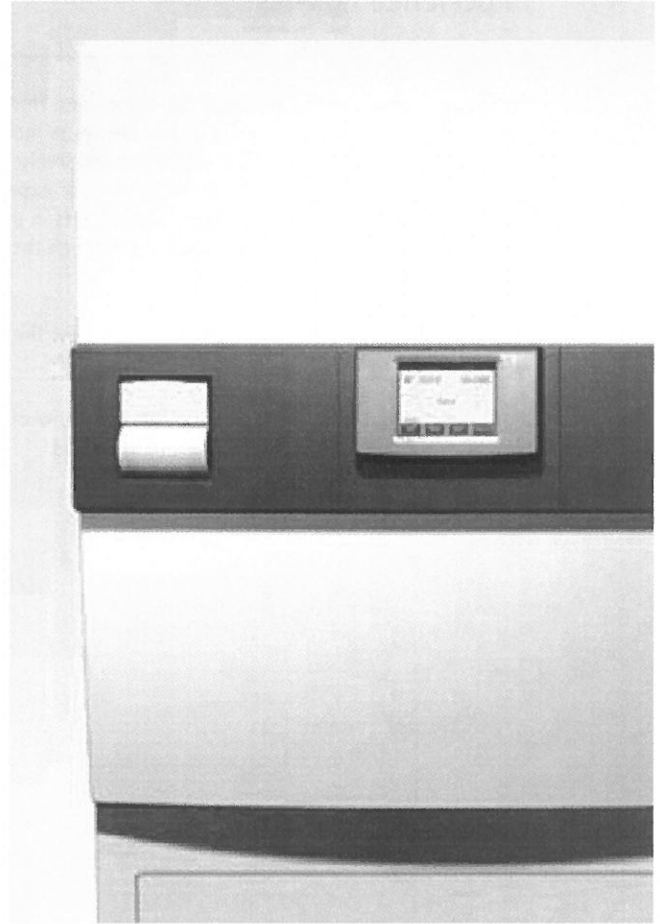
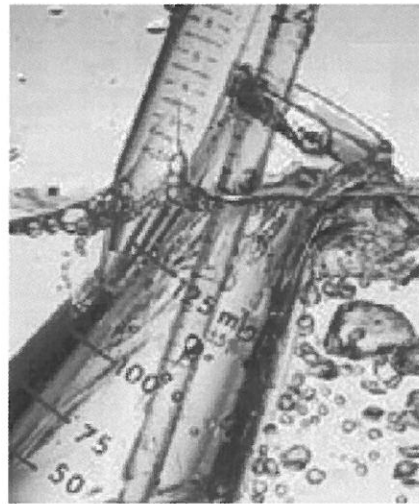
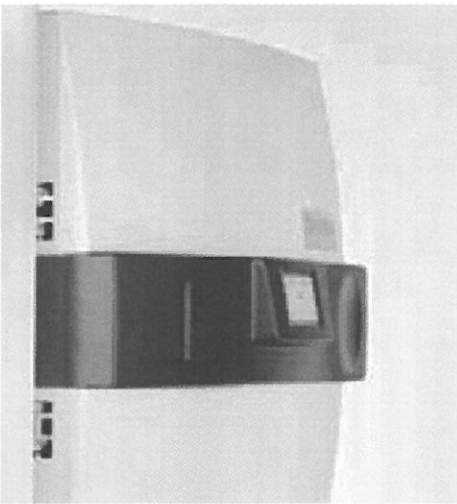
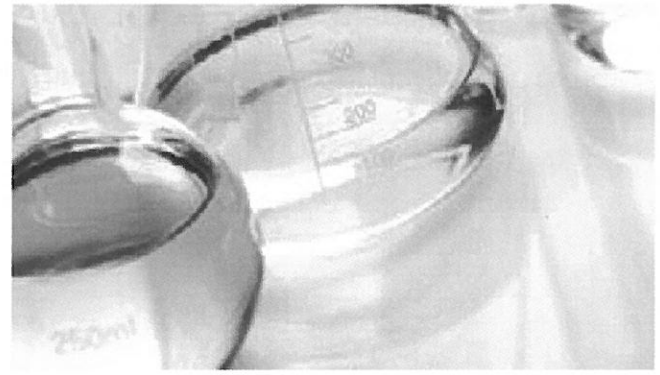
Taken, subscribed, and sworn to before me this 14th day of May, 2014.

My Commission expires June 9, 2014.

AFFIX SEAL HERE

NOTARY PUBLIC Laura L. Goodrich





Systec Laboratory Autoclaves

Systec H-Series. Horizontal floor-standing autoclaves.

Systec H-Series 2D. Pass-through autoclaves.



Microbiology
INTERNATIONAL

Global Innovation • Superior Support



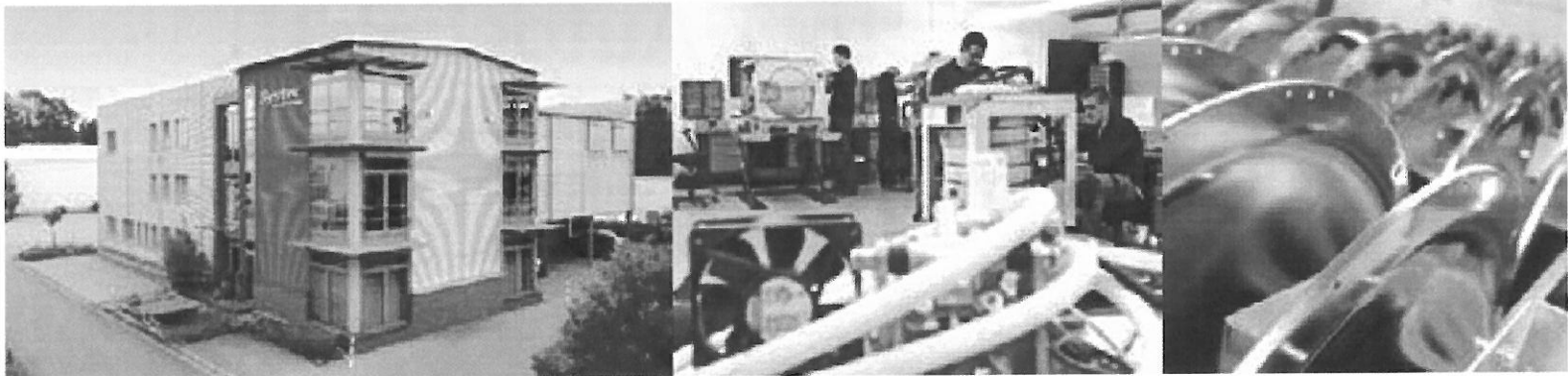
Performance and competence.

Experience counts

We focus on only one thing: laboratory autoclaves. However, we do this exceptionally well! Our goal is always to make steam sterilization in the laboratory safer, easier, more precise and of course more economical. With over 20 years of experience and continuous intensive cooperation with experts in practice, 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 easier, safer, precise, reproducible and validatable.

Contents

- Systec H-Series. Horizontal floor-standing autoclaves. 04
- Systec H-Series 2D. Pass-through autoclaves. 06
- Performance characteristics
Systec H-Series and H-Series 2D 08
- Design and Engineering 10
- Control and Documentation 13
- Processes and Applications 16
- Loading 22
- Custom Developments 23
- Qualification and Validation 24
- Sales and Service 25
- Overview 27



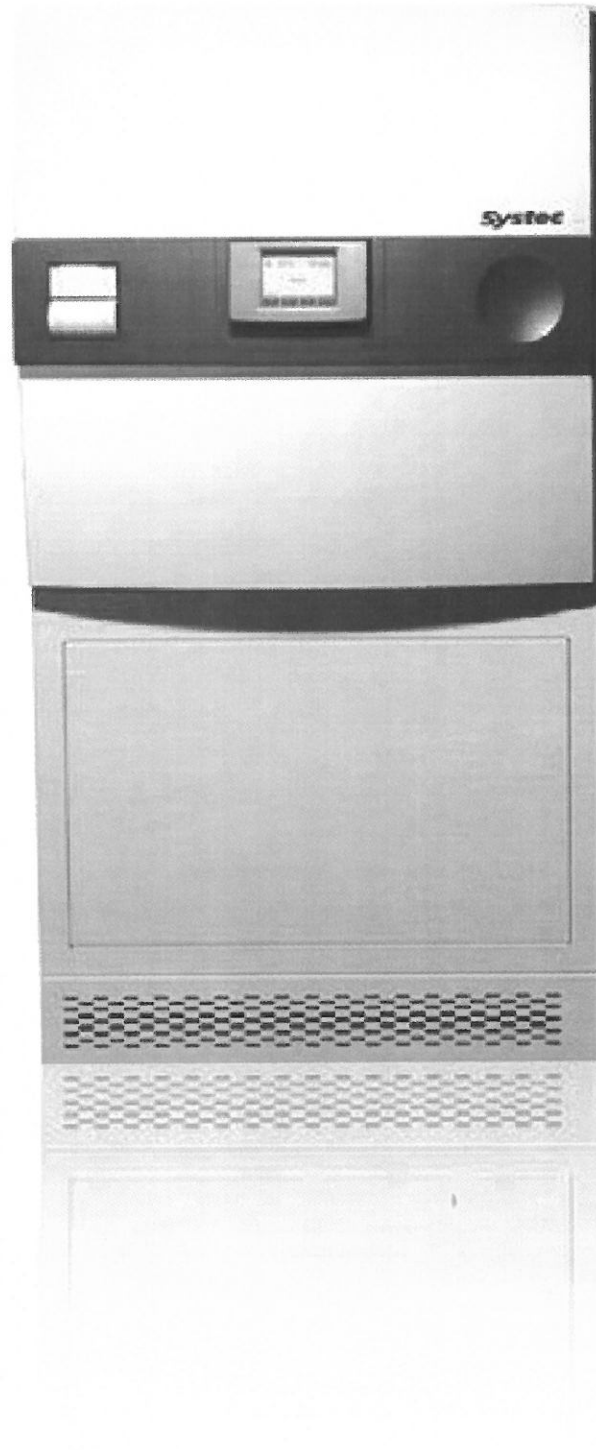


Systeme H-Series. Horizontal floor-standing autoclaves.

HX

Autoclaves of the performance category HX can be used for all laboratory applications, even for sophisticated sterilization processes. All additional optional accessories can be fitted to obtain validatable processes.

In spite of the high loading capacity, these autoclaves are compact and have a comparatively low weight.



16 models
65 to 1580 l
chamber
capacity



Dimensions and performance

Systec	HX-65	HX-90	HX-100	HX-150	HX-200
Chamber dimensions Ø x depth in mm	400 x 500	400 x 700	500 x 500	500 x 750	500 x 1000
Chamber volume in liters total/nominal	70/65	95/90	110/100	160/150	210/200
External dimensions in mm					
Height	1430	1430	1530	1530	1530
Width	690	690	790	790	790
Depth	910	1110	930	1180	1430
Net weight	230	250	250	275	290

Systec	HX-210	HX-320	HX-430	HX-540	HX-650
Chamber dimensions Ø x depth in mm	740 x 500	740 x 750	740 x 1000	740 x 1250	740 x 1500
Chamber volume in liters total/nominal	280/210	385/320	495/435	602/540	710/650
External dimensions in mm					
Height	1683	1683	1683	1683	1683
Width	930	930	930	930	930
Depth	1035	1285	1535	1785	2035
Net weight	540	555	605	638	705

Systec	HX-580	HX-780	HX-980	HX-1180	HX-1380	HX-1580
Chamber dimensions Ø x depth in mm	1000 x 750	1000 x 1000	1000 x 1250	1000 x 1500	1000 x 1750	1000 x 2000
Chamber volume in liters total/nominal	755/580	950/780	1150/980	1345/1180	1541/1380	1735/1580
External dimensions in mm						
Height	1850	1850	1850	1850	1850	1850
Width	1255	1255	1255	1255	1255	1255
Depth	1450	1700	1950	2200	2450	2700
Net weight	810	850	920	990	1050	1110

Electrical connections for the Systec HX-65 to HX-200: 230 V, 3-phase, 30 Amp
 Electrical connections for the Systec HX-210 to HX-1580: 230 V, 3-phase, 50 Amp
 Different voltage available upon request.



System H-Series 2D. Pass-through autoclaves.

HX

Triple safety aspects

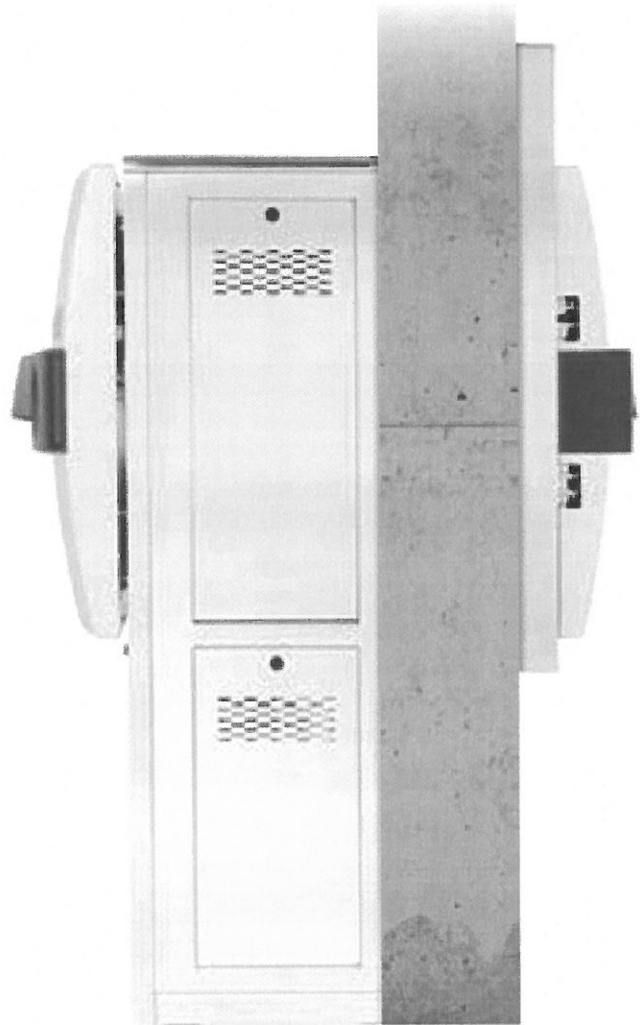
- One door only can be opened at a time. If one door is open, the other is automatically locked.
- If the autoclave is switched off or if no current is available (e.g. power failure), both doors remain locked.
- If the door at the non-sterile side is opened, a sterilization program has to be performed before the door at the sterile side can be opened.

The locking system can be adapted to customers' wishes. Doors and control panel are made of heat-insulating plastic, the housing completely of stainless steel and the stainless steel edges specially processed for smooth junctions with walls. Operation, however, can be carried out from both sides, the position (open or closed) of the opposite door being indicated on the display.

For use under the most stringent clean room and safety conditions

- For biological safety laboratories. Fitting as a sterilization and pass-through lock for protecting the external environment.
- For clean rooms in laboratories and production facilities as a sterilization and pass-through lock separating sterile and non-sterile areas.

13 models
90 to 1580 l
chamber
capacity





Dimensions and performance

Systec	HX-90 2D	HX-150 2D	HX-200 2D
Chamber dimensions Ø x depth in mm	400 x 750	500 x 750	500 x 1000
Chamber volume in liters total/nominal	98/90	155/150	205/200
External dimensions in mm			
Height	1430	1530	1530
Width	690	790	790
Depth	1160	1200	1450

Systec	HX-320 2D	HX-430 2D	HX-540 2D	HX-650 2D
Chamber dimensions Ø x depth in mm	740 x 750	740 x 1000	740 x 1250	740 x 1500
Chamber volume in liters total/nominal	370/320	480/430	590/540	700/650
External dimensions in mm				
Height	1683	1683	1683	1683
Width	930	930	930	930
Depth	1210	1460	1710	1960

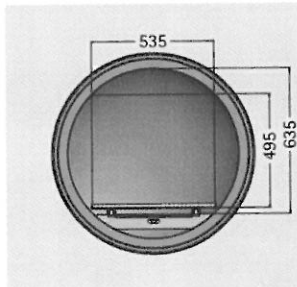
Systec	HX-580 2D	HX-780 2D	HX-980 2D	HX-1180 2D	HX-1380 2D	HX-1580 2D
Chamber dimensions Ø x depth in mm	1000 x 750	1000 x 1000	1000 x 1250	1000 x 1500	1000 x 1750	1000 x 2000
Chamber volume in liters total/nominal	670/580	870/780	1070/980	1270/1180	1470/1380	1670/1580
External dimensions in mm						
Height	1850	1850	1850	1850	1850	1850
Width	1255	1255	1255	1255	1255	1255
Depth	1500	1750	2000	2250	2500	2750

Electrical connections for the Systec HX-90 2D to HX-200 2D: 230 V, 3-phase, 30 Amp
 Electrical connections for the Systec HX-320 2D to HX-1580 2D: 230 V, 3-phase, 50 Amp
 Different voltage available upon request.

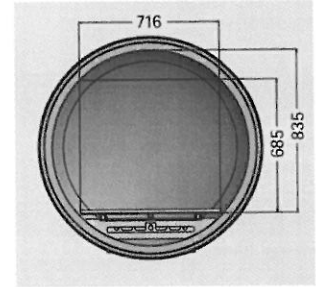


System H-Series, System H-Series 2D.

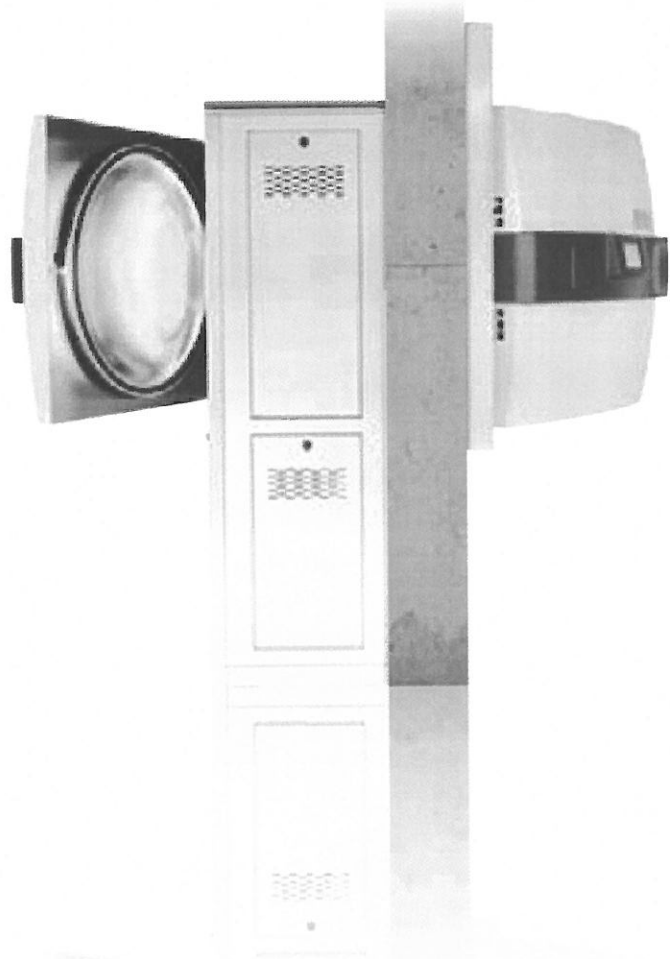
Available with two chamber diameter: 740 mm and 1000 mm.
1000 mm diameter chamber provides the usable chamber dimension of a 6x6 square chamber autoclave.



Diameter 740 mm



Diameter 1000 mm





Technical standard feature.

HX

Standard Features	
Integrated, separate steam generator	■
Housing, support frame and pressure vessel made of corrosion-resistant stainless steel	■
Temperature and pressure range 140 °C, 4 bar	■
Touch-Screen control	■
Number of sterilization programs	up to 100
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	
Extension of temperature and pressure ranges to 150 °C/5 bar (from chamber volume 65 liters to 650 liters)	<input type="checkbox"/>
Options for process optimization	
Rapid cooling for efficient and safe cooling of liquids	<input type="checkbox"/>
Vacuum system for validatable sterilization of solids and waste materials in disposal bags	<input type="checkbox"/>
Superdry: for drying solids (only in combination with optional vacuum system)	<input type="checkbox"/>
Exhaust filtration (including condensate inactivation) for safe sterilization of hazardous biological substances	<input type="checkbox"/>
Options for documentation	
Integrated printer for batch documentation	<input type="checkbox"/>
PC software for comprehensive documentation	<input type="checkbox"/>
Comlog: includes USB – and Ethernet-Connection and internal memory for up to 10,000 sterilization cycles, including documentation software on Comlog. The software can be called up independent of platform (PC, laptop, tablet, smart phone), facilitating remote service	<input type="checkbox"/>
AuditTrail: unalterable and traceable documentation acc. to FDA 21 CFR Part 11	<input type="checkbox"/>

- 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.

■ = Standard
 = Optional



Design – pure innovation.

State-of-the-art engineering

All Systec autoclaves have been newly developed and designed and represent state-of-the-art engineering. All mechanical and electronic components guarantee enhanced sterilization processes, hence enabling the lab to fulfill all appropriate requirements for today and for 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.

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

	HX
Demineralized water inlet for steam generation	■
Compressed air	■
Cooling water	□
Common outlet	■
RS-232/RS-485 interfaces	■
Flexible cord with CEE plug	■

■ = Standard
□ = Optional

All according to norms and regulations

Equipped for the future! Systec H-Series autoclaves are the first to be designed 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.

Available for Systec H-Series autoclaves 65 to 650 liter.

Systec autoclaves comply with the following standards:

Pressure vessel:

- 97/23/EG Pressurized Vessel Guideline.
- ASME Boiler & Pressure Vessel Code, Section VIII, Division 1.
- China Stamp.

Other guidelines:

- 2006/95/EG Low Voltage Directive.
- 2004/108/EG on Electromagnetic Compatibility.
- 2006/42/EG Machinery Directive.

All autoclaves are CE-certificated.





Safety and convenience

HX

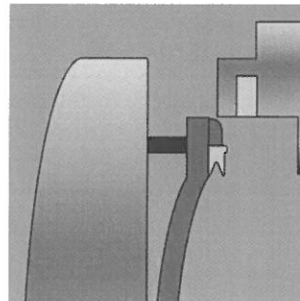
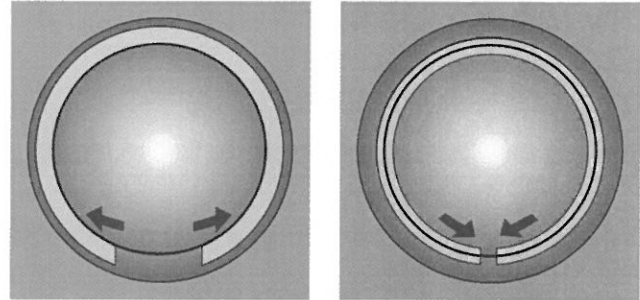
Novel automatic door-opening system

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!

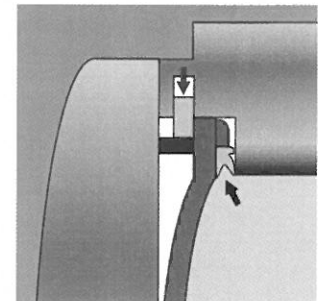
The door-locking system is temperature-dependent according to pressure vessel regulation TRB 402 and DIN 58946, Part II. The door remains locked as long as there is excess pressure in the chamber. The door and other parts of the pressure vessel and housing are made of stainless steel. The attractively 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 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.



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.





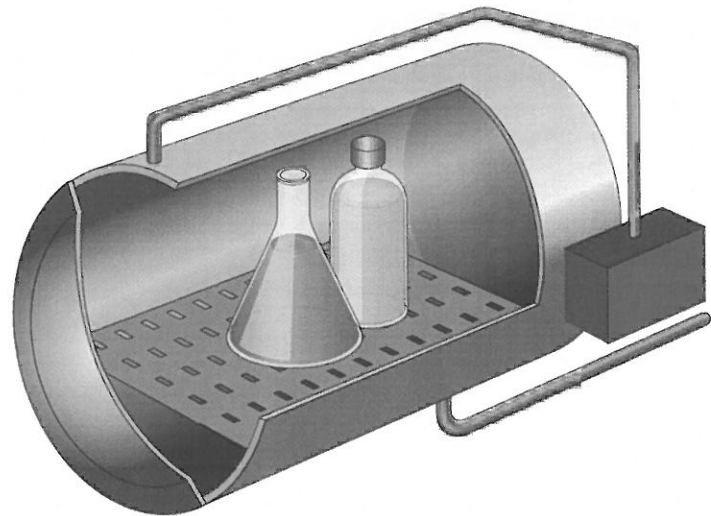
Design – pure innovation.

Steam generation by steam generator

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 H-Series

Condensation of steam instead of removal

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.

Operation by Touch-Screen

Operation is even quicker and easier using a 5.7-inch easy-to-read display with touch function. This innovation offers additional possibilities 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 as required up to 100 by the user.

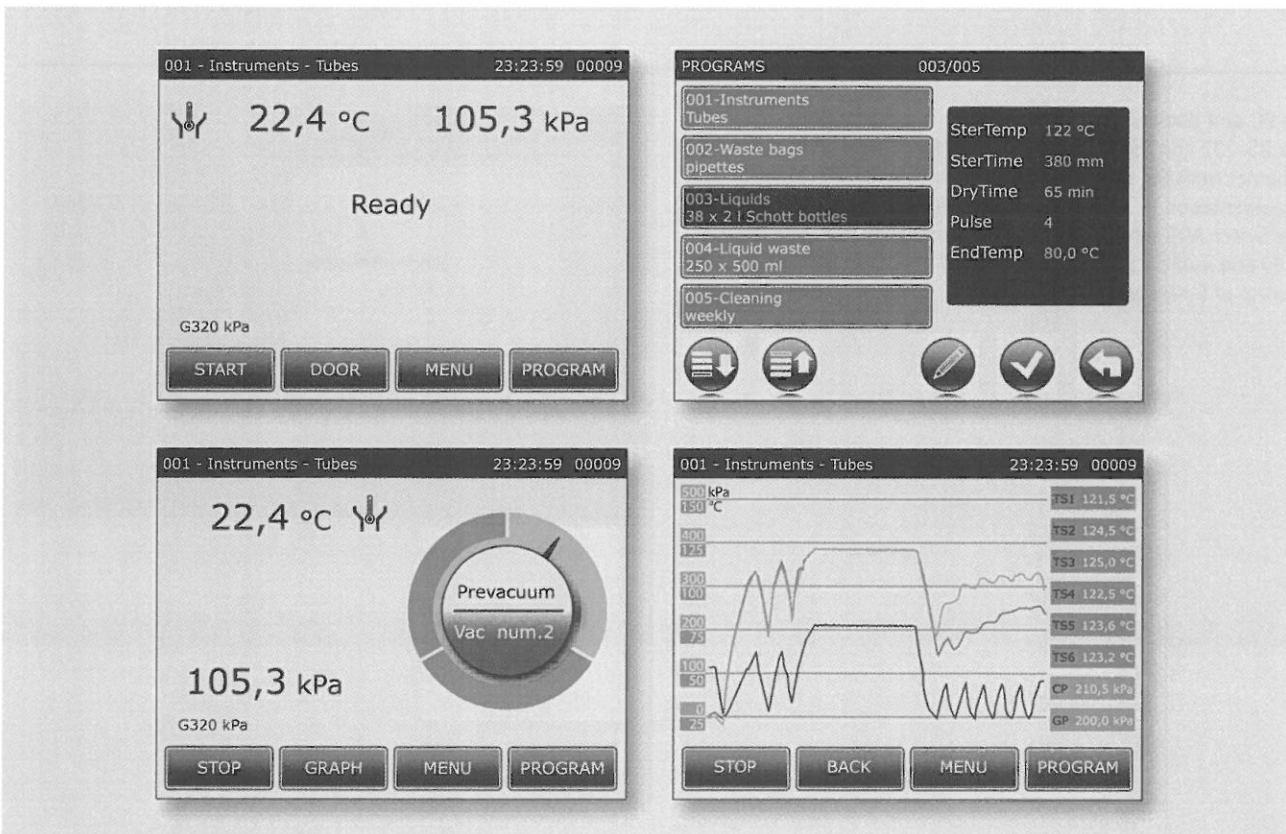
To initiate a new program, the user is guided through the process by menu dialog. Every new program is automatically allocated a permanent, unalterable name and can also be given an individual designation by the user. All process parameters can be individually altered.

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.





Everything under control.

Alternative documentation

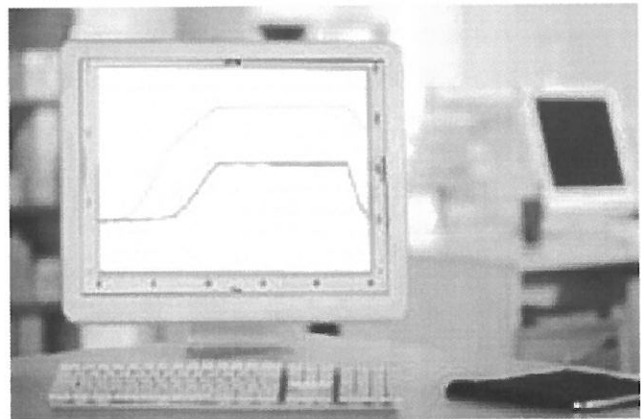
By printer

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



By PC and documentation software

Via RS-232 and RS-485 interface directly connected to a PC or an ethernet network. Special software available for Windows for the documentation of all process data, including informative diagrams. The System ADS software processes documented data both graphically and numerically and can be used for parameterization and control of System autoclaves.





By Comlog

Optionally available for all Systec HX models.

This solution adds a USB and an Ethernet port for connection to an ethernet network. Includes documentation software on Comlog that is platform-independent and can be accessed by the user from any PC, laptop, tablet or smart phone. The internal memory card stores up to 10,000 sterilization cycles.

Comlog enables remote access via Internet, for example for Systec service personnel (if approved by customer IT).

By AuditTrail

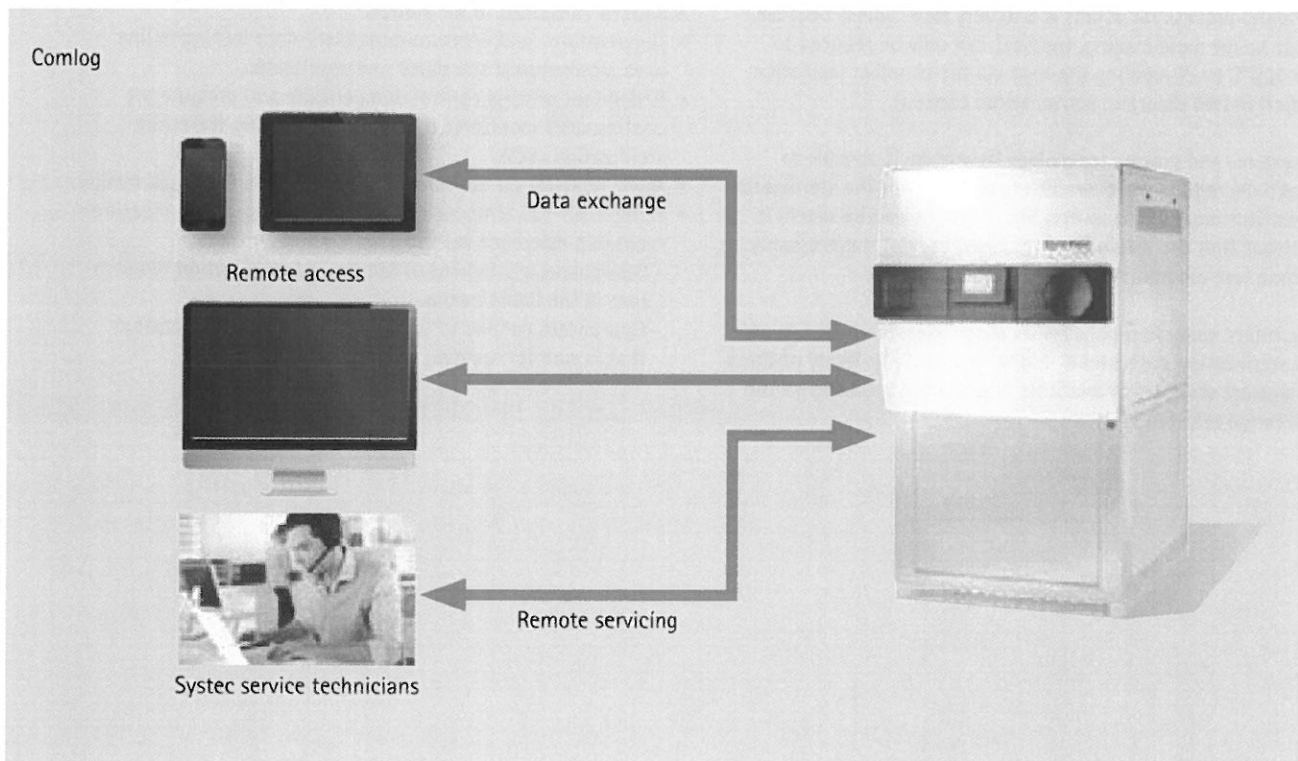
For Systec models HX in combination with optional accessory Comlog.

This solution comprises all the functions of Comlog and enables documentation according to FDA 21 CFR Part 11.

AuditTrail allows to set-up and administer users for the autoclave. 5 different authorization levels are available specifying which actions can be carried out by which users. In addition, access rights for specific sterilization programs can be individually allocated.

Before any specific action, the user must register with user name and password. All actions carried out (e.g. change of parameters or starting/stopping programs) are documented and can be traced to the user, including time stamp (day/time).

All data generated through actions carried out by the user or the documentation of a sterilization cycle is protected from manipulation and is tagged with the electronic signature of the user.





Sterilization of liquids.

Heating up

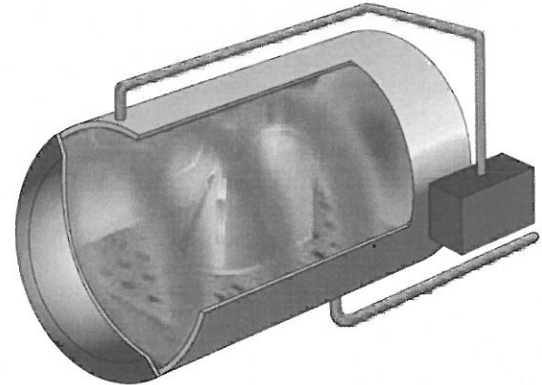
The actual sterilization time of e.g. 15 to 20 minutes at 121 °C is only a fraction of the total time involved for an autoclave procedure. Especially in the case of sterilizing liquids, the heating up and cooling down phases are considerably longer.

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 100 °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 H-Series

Cooling

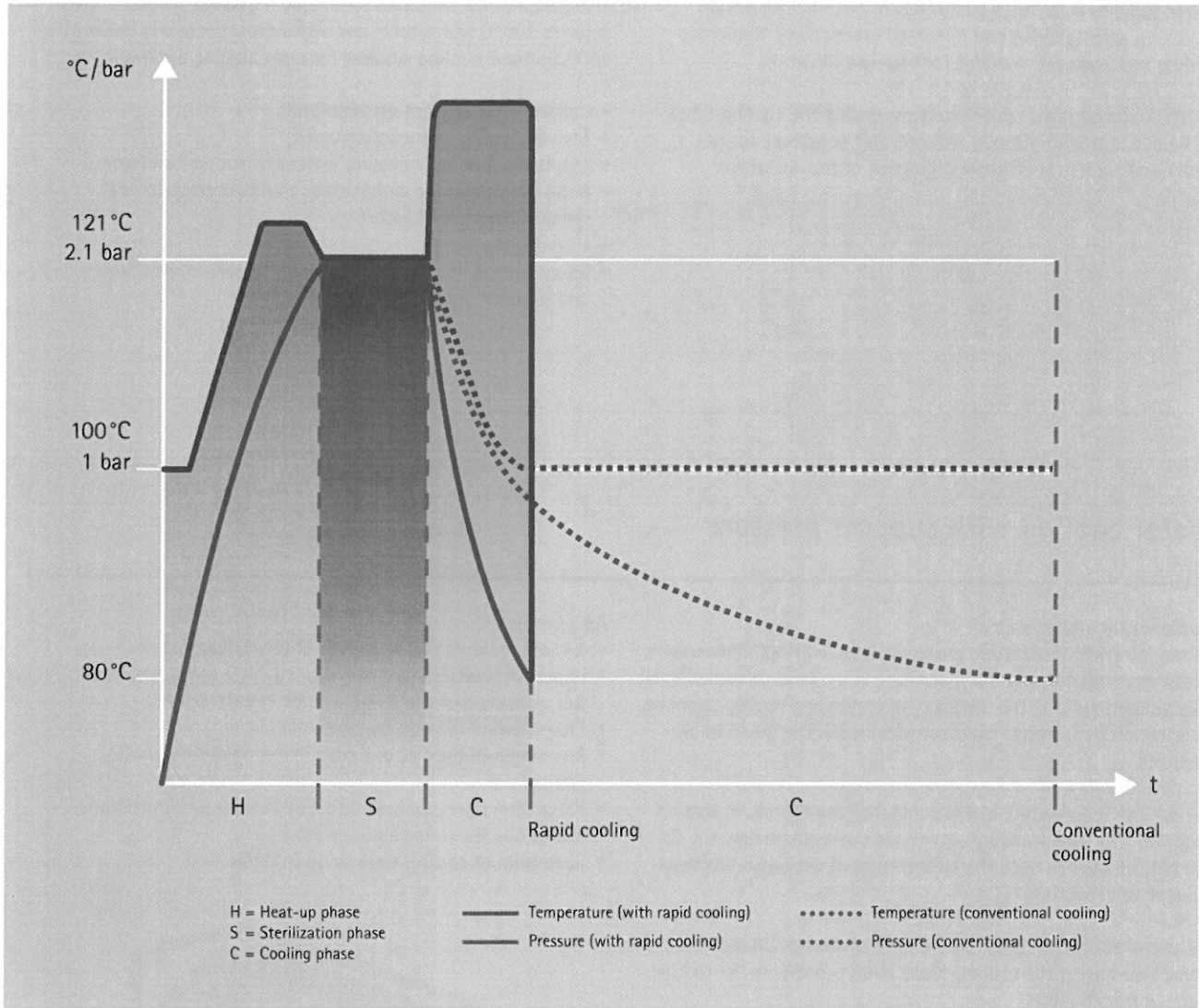
The cooling process for liquids is also very slow; this is because, without active rapid cooling, the heat can only be reduced to below 100°C by dissipating the heat via the chamber insulation by radiation (see diagram: conventional cooling).

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.



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



Sterilization of liquids.

Cooling

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 re-cooled sterile water and support pressure.

Water cooling with support pressure

Permanently under control

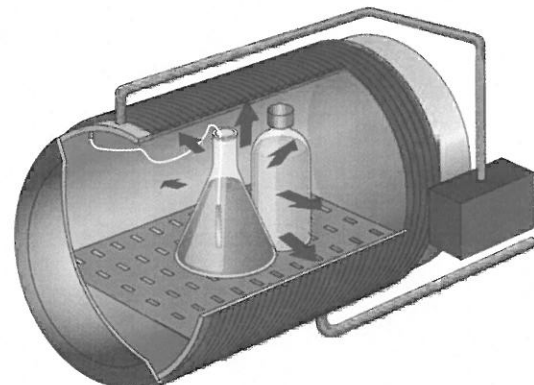
During the entire sterilization process, a flexible PT-100 temperature sensor monitors the water temperature in a reference vessel. It is thus guaranteed that the sterilization period begins only once the sterilization temperature has been attained in the liquid to be sterilized.

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%.



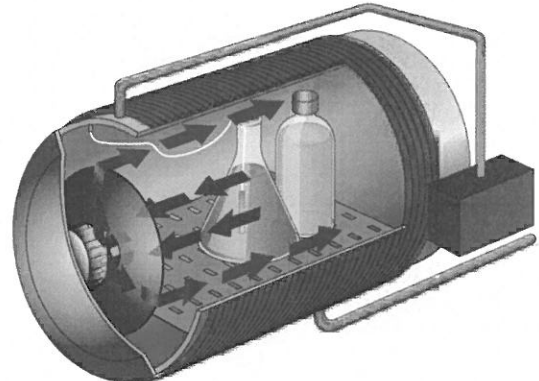
Systec H-Series



Radial Ventilator

Together with water cooling with support pressure, the ventilator ensures accelerated removal of heat from the sterilization items to the cooled chamber mantle. The ventilator is located in the lid of the chamber (no reduction of chamber depth!) and is driven by a magnetic motor fitted outside under the cover.

- Ventilation performance 250 m³/h.
- Reduction of cooling time by up to 70%.

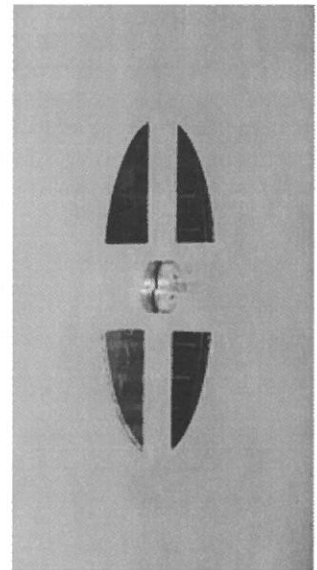
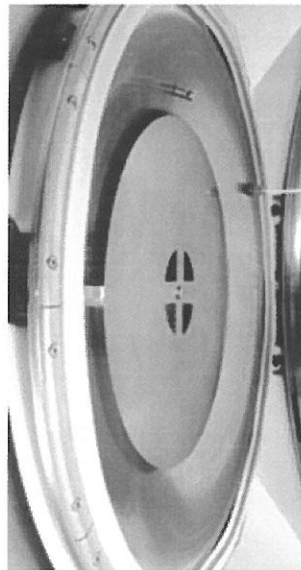


Systec H-Series

Ultracooler

In conjunction with optional water cooling system with support pressure and Radial Ventilator Systec succeeded to reduce again the cooling time and hence the overall sterilization time considerably through integration of an additional heat exchanger.

- Reduction of cooling time by up to 90%.
- Depending on the load, cooling times between 15 and 60 minutes can be achieved.



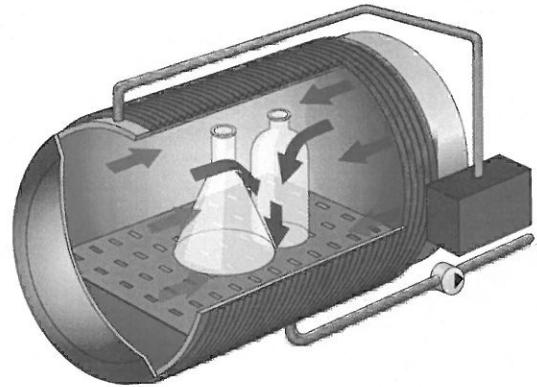


Sterilization of solids and waste in disposal bags.

Vacuum system

Typical solids are e.g. pipette tips (in boxes), empty glassware and waste in bags as well 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.

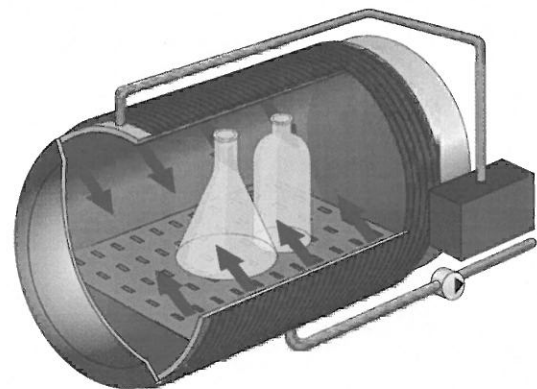
The vacuum device removes the air highly effectively from solids, tubing, porous materials, fabrics and disposal bags; in this way, the steam is able to penetrate completely. The process includes a fractionated pre-vacuum phase in combination with the standard steam generator. Only in this way is it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



Systec H-Series

Superdry – for drying solids

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 conjunction with Superdry avoids the necessity for subsequent drying in a separate drying cabinet.



Systec H-Series



Sterilization of hazardous biological substances.

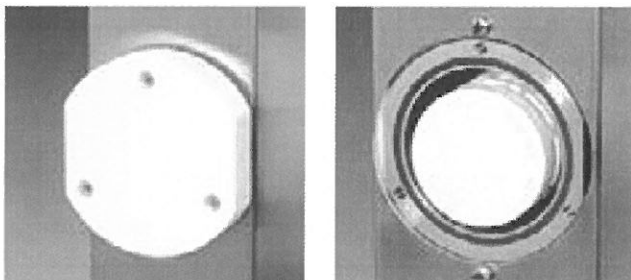
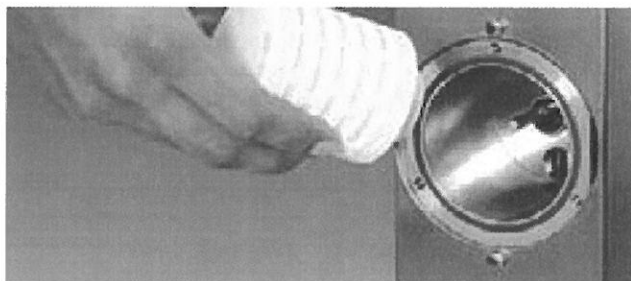
Permanently monitored – exhaust air filtration with condensate inactivation

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

The autoclavable sterile filter comprising a filter cartridge with PTFE membrane, pore size 0.2 µm, incorporated in a pressure-resistant housing, easy replaceable. The filter is automatically sterilized during each sterilization process, monitored by a 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 or 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 thus important for you to think carefully about your requirements so that the autoclave can be optimally configured to the tasks on hand.

A validatable sterilization process of confirmable 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 Exhaust air filtration
	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	
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.

Systec H-Serie, H-Serie 2D

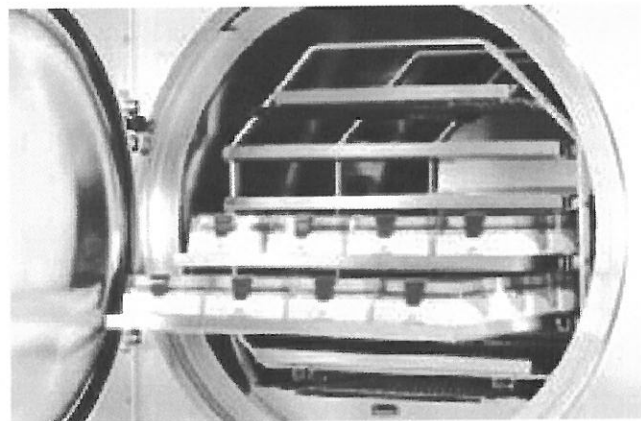
Transport and loading trolley

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

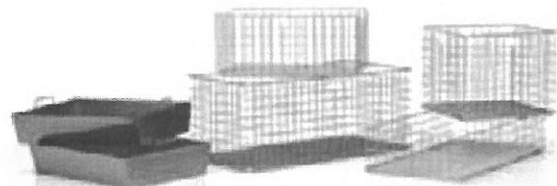
To fully utilize the available space in the chamber, especially when sterilizing small items, the autoclaves can be fitted with loading shelves. The entire shelving system or individual trays can be removed.



Stainless steel quality

All components are made of stainless steel and cleanly welded. The transport trolleys have large rollers, two of them fitted with brakes to ensure smooth running.

Loading baskets and inserts available upon request.





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 waste water sterilization (flow-through principle with integrated stirring and high-performance heating elements).
- Autoclaves for the sterilization of hand-wash water.
- Autoclaves for environmental simulation with programs for up to 99 days of testing, e.g. for:
 - Generation of steam and heat.
 - Generation of pressure and heat.
 - Heating up and cooling down in repetitive mode.

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.



System service stations in Germany

A System service technician is always near you and contactable any time through our central service number: +49 641 98212-0





Sales and Service. Worldwide via trained partners.

Systec service locations worldwide

Systec laboratory autoclaves are currently operating reliably in numerous countries of the world. Our competent partners are available to you for consultancy, 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

Media preparation and handling.

Systems for the production and sterilization of microbiological culture media and the automatic filling and stacking of Petri dishes

- Mediapreparators
Systec Mediaprep
- Petri dish filling line
Systec Mediafill



Microbiology

INTERNATIONAL

Global Innovation • Superior Support

5111 Pegasus Court, Suite H
Frederick, MD 21704
800-396-4276
www.800EZMICRO.com

