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Технические характеристики на стерилизаторы с оксидом этилена GEE компании **GETINGE**



Safe and efficient sterilization

GEE Ethylene Oxide (EO) Sterilizers for heat-sensitive goods

Faster and reliable

Low Temperature

Sterilization

For several decades, Getinge has supplied Ethylene Oxide Sterilization Systems worldwide. Technological advances utilized in our EO product range provide a faster, more reliable sterilization while protecting the integrity of products and packaging.

By being part of your production process, we can contribute to manufacturing using a sterilization method which allows the product to remain packed and palletized for the entire process, and is ready to ship without the need for additional re-packing or handling.

Ideal Technology for your Application

The unique properties of Ethylene Oxide (EO) make it suitable for sterilization of products that are sensitive to heat and humidity, including modern plastics and drug coated devices. EO can penetrate wrapped and packaged goods to effectively sterilize at very low temperatures, making it the ideal technology for low temperature terminal sterilization.

Optimal Systems for your requirements

By your side every step of the way, we support you with optimizing a complete EO sterilization plan for your specific product, workflow and facility layout. Getinge GEE Sterilizers provide a state of the art hardware and control system for analytics and diagnostics along with parametric release and goods tracking options.

Performance

Using leading edge construction techniques and the highest grade materials and components, Getinge ensures optimal design, performance and life cycle economy to make the most of your capital investment.

Safe production processes

The safety of your staff is of paramount importance. GEE Sterilizers are built for full compliance with ATEX regulations and all designs are subject to risk and failure analysis techniques (HAZOP, FMEA). Our systems include redundant safety features to secure your process and give you a peace of mind.

Control of the EO

A built-in automatic chamber leak rate test tests the integrity of the chamber as part of every cycle. The EO is vaporized by gas dispensing equipment located outside the building, which prevents liquid EO from entering the facility.

Leak-tight door design

When closed, the GEE door is sealed using a dual gasket system that will remain leak tight even if all services fail. The door is automatically sealed by pushing the two door seals against the door face using pressurized nitrogen. A pressure switch monitors the pressure behind the seal. In the event of a loss of nitrogen, a high-pressure tank will back up the door seal until the sterilizer can complete a process to safe cycle end.

Process safety through PLC and SCADA

The PLC activates alarms when the process is outside normal operating parameters and reacts accordingly with appropriate steps. With the SCADA operator control station option, sophisticated software calculates if the cycle will operate within the flammability curve and automatically informs the operator if the programmed cycle has a flammable mix. It can also be set up to inhibit cycle start, if required.



Global and local regulations

Getinge ensures each GEE Sterilizer is engineered to meet industry standards while complying with local, national and global regulations: ATEX, EN, ISO 11135, ANSI, AAMI NFPA. Getinge vessels can be built in compliance with ASME, PED or MHLW. Every unit is manufactured in our ISO 9001 controlled production facility.

Process outline

The EO sterilization process consists of three stages. These stages can be performed within the sterilizer chamber or in three separate chambers.

Post-conditioning/degassing
In the post-conditioning stage, the gas is removed from the product and packaging for safe downstream handling.

EO sterilization
The load is sterilized with the correct concentration of EO gas at low temperatures.

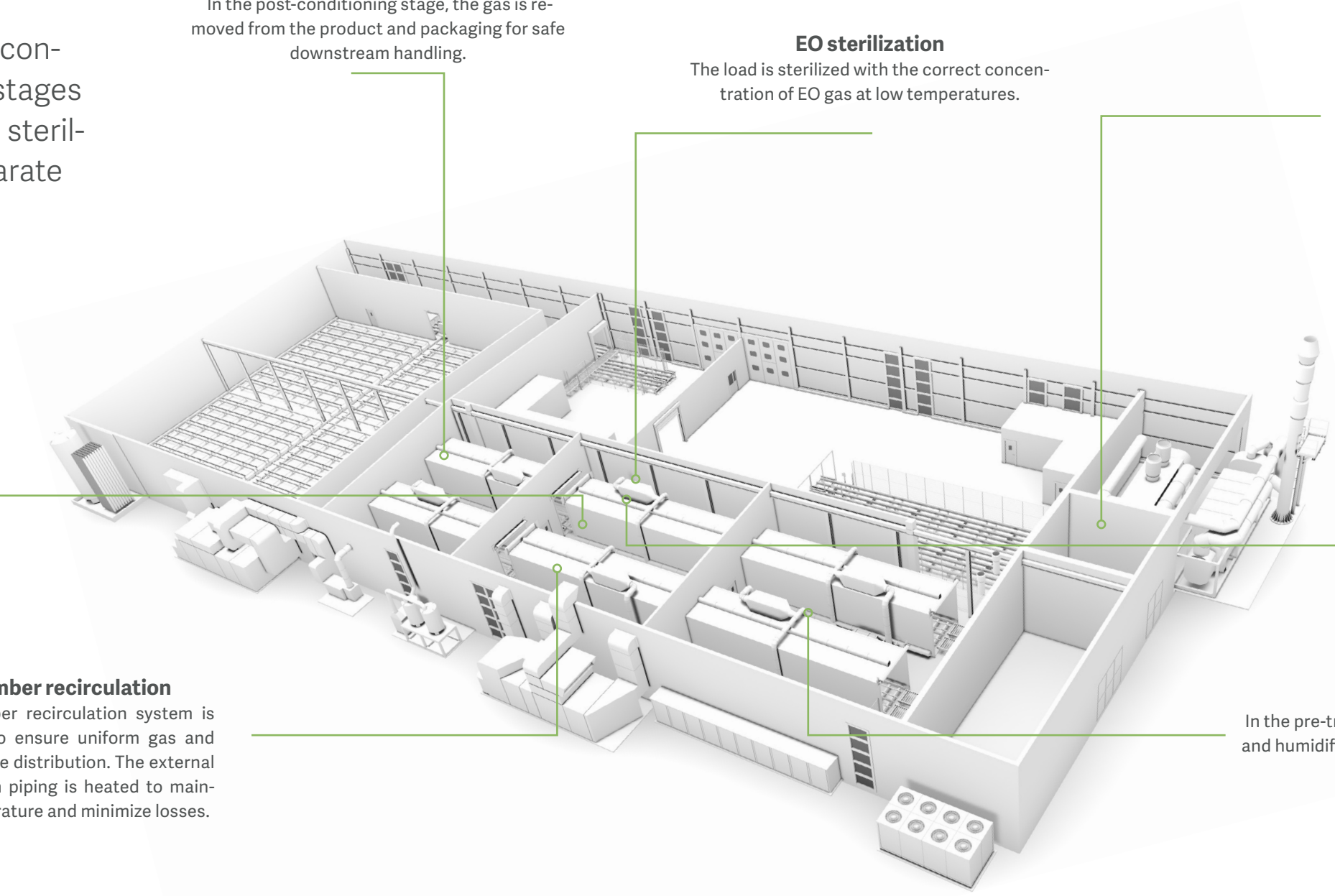
Gas dispensing
EO is usually supplied as liquid in pressurized containers. Vaporization ensures that liquid EO does not enter the sterilization area. The heating medium can be either steam or hot water for accurate temperature control and flow regulation.

Temperature control
To ensure rapid heating and a consistent load temperature, heated water is circulated through the jacket and doors. If required, a cooling system can also be included for rapid transition to lower temperatures.

Chamber recirculation
The chamber recirculation system is essential to ensure uniform gas and temperature distribution. The external distribution piping is heated to maintain temperature and minimize losses.

Vacuum system
GEE EO Sterilizers are equipped with liquid ring vacuum pumps providing efficient air removal from sterilizer chamber and internal load. The vacuum system removes high concentrations of EO from the chamber in a short period of time.

Pre-treatment
In the pre-treatment stage the load is heated and humidified in preparation for sterilization.

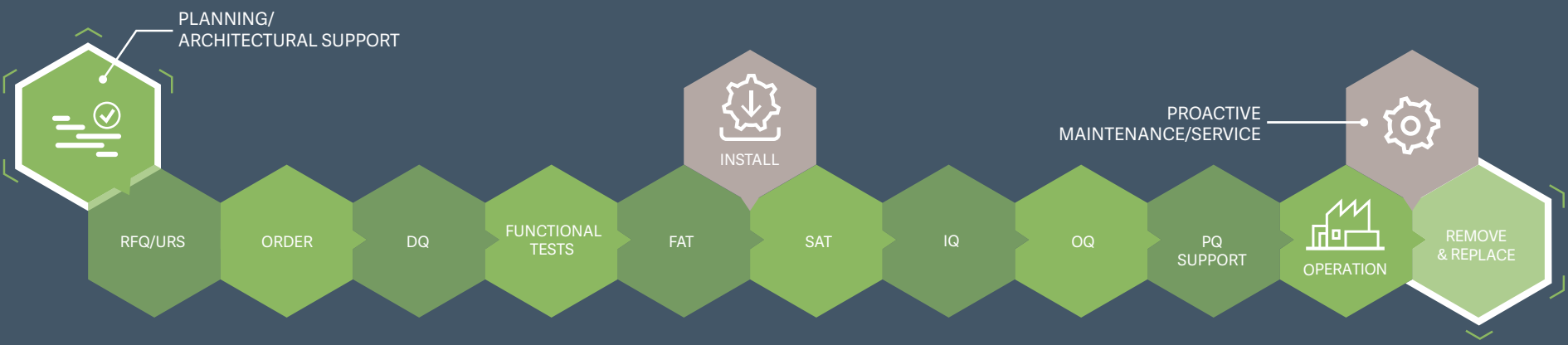


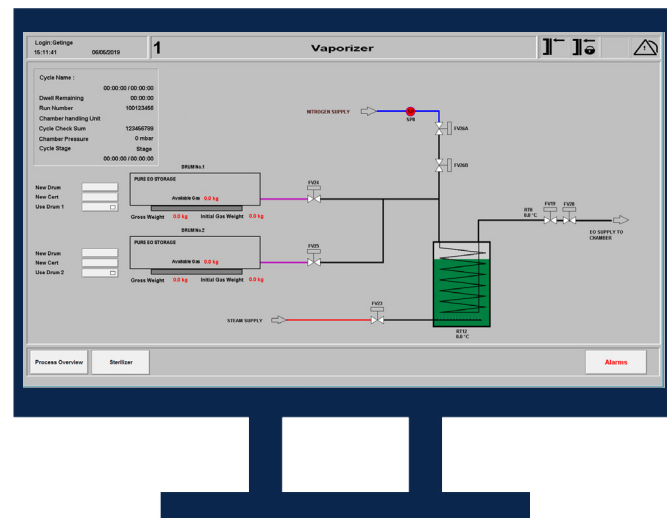
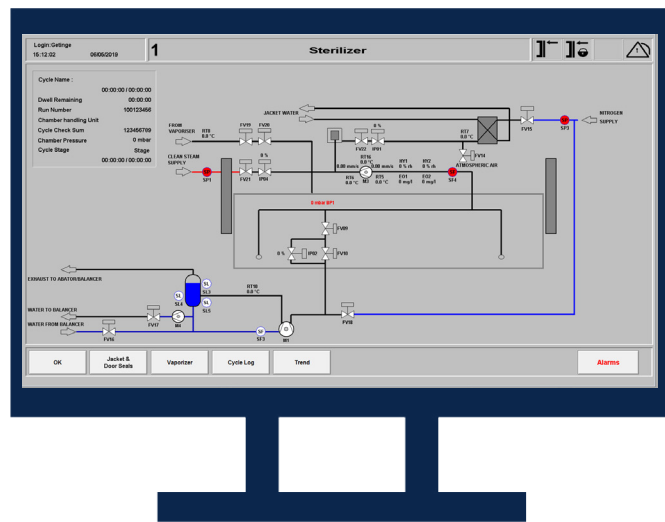
With you every step of the way

Our commitment goes far beyond supplying equipment. We support you with project planning and setting the right specifications and requirements.

Our experience in manufacturing, installation and commissioning allows us to manage the project from start to finish. When in operation, proactive maintenance secures your uptime.

In short – we are with you every step of the way.





A legacy of engineering

Our sterilizers are developed and manufactured in Getinge, Sweden, where it all started in 1904. Since then we have grown to a global company, but still keep the core of our manufacturing of our Ethylene Oxide Sterilizers where our global Quality and Control systems apply.

We take pride in our engineering and give full attention to detail.

Our processes are constantly updated with new technology in full compliance with changing regulations. When visiting our state-of-the-art factory, with its production area of 16,200 m², you find the latest welding robots working side by side with engineers and technical experts with welding qualifications applicable to a global market. All production facilities are certified to ISO 9000 and ISO 14000 standards. We work with our manufacturing and supply chain to reduce environmental impact.



Flexible recipe cycle configuration

- Automation and traceability optimize your process

Control system

GEE Ethylene Oxide Sterilizers are equipped with a PLC automation (Allen Bradley or Siemens) system and are usually connected to a central supervisory control and data acquisition (SCADA) system for overall process monitoring and control. The system provides audible and visual notification in event of deviation from the operating parameters. The PLC can be configured for specific process requirements allowing for optimization of your processes while protecting the product packaging by controlled pressure and vacuum ramping. Data storage, format and monitoring are fully flexible to support specific process needs.



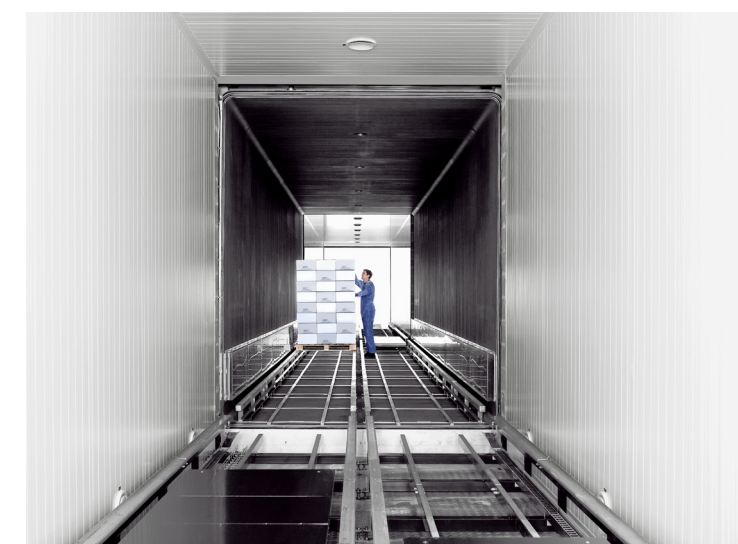
SCADA

The HMI interface is built on a full SCADA system that is 21CFRPart11 capable. The system includes multiple screens for process viewing and system operations. Built-in traceability functions ensure all processes, machines, and pallets are registered and documented throughout the process. Batch reporting features include both detailed and summarized reports as well as auto batch release functions.



Load handling

Getinge's automatic pallet transfer system (APTS) is a safe pallet lift and movement system that can transfer single or multiple pallets in two linear directions for automatic loading of the products. Pallets are accurately positioned within the chamber to maximize throughput and cycle efficacy. The system has no moving parts within the sterilizer chamber and requires no operator entry into the EO chamber, making it a safe solution. Movement using pneumatic motors and components allows for system operation in hazardous classified environments.



Chamber sizing

Many options to suit any application

Getinge offers the widest range of chamber sizes available from any manufacturer, accommodating standard pallets or purpose designed loading racks. Below is a sample of the standard range. Custom sizes to suit almost any load are also available.

European Pallet Size (1200 x 800 mm)			US Pallet Size (1200 x 1000 mm)	
Pallets	GEE - Model	Usable Dimensions W x H x D mm / Inch	GEE - Model	Usable Dimensions W x H x D mm / Inch
Single Line				
	101415	1000 x 1450 x 1540 mm / 39" x 57" x 60"		
	101425	1000 x 1450 x 2500 mm / 39" x 57" x 98"		
	101433	1000 x 1450 x 3300 mm / 39" x 57" x 130"		
2	142619	1450 x 2600 x 1900 mm / 57" x 102" x 90"	142623	1450 x 2600 x 2300 mm / 57" x 102" x 91"
3	142628	1450 x 2600 x 2800 mm / 57" x 102" x 133"	142634	1450 x 2600 x 3400 mm / 57" x 102" x 134"
4	142637	1450 x 2600 x 3700 mm / 57" x 102" x 177"	142645	1450 x 2600 x 4500 mm / 57" x 102" x 177"
6	142655	1450 x 2600 x 5500 mm / 57" x 102" x 263"	142667	1450 x 2600 x 6700 mm / 57" x 102" x 264"
8	142673	1450 x 2600 x 7300 mm / 57" x 102" x 350"	142689	1450 x 2600 x 8900 mm / 57" x 102" x 350"
12	1426109	1450 x 2600 x 10900 mm / 57" x 102" x 523"	1426131	1450 x 2600 x 13100 mm / 57" x 102" x 516"
16	1426145	1450 x 2600 x 14500 mm / 57" x 102" x 696"	1426177	1450 x 2600 x 17700 mm / 57" x 102" x 697"
Double Line				
6	282628	2900 x 2600 x 2800 mm / 114" x 102" x 110"	292634	2900 x 2600 x 3400 mm / 114" x 102" x 134"
8	282637	2900 x 2600 x 3700 mm / 114" x 102" x 177"	292645	2900 x 2600 x 4500 mm / 114" x 102" x 177"
12	282655	2900 x 2600 x 5500 mm / 114" x 102" x 263"	292667	2900 x 2600 x 6700 mm / 114" x 102" x 264"
16	282673	2900 x 2600 x 7300 mm / 114" x 102" x 350"	292689	2900 x 2600 x 8900 mm / 114" x 102" x 350"
24	2826109	2900 x 2600 x 10900 mm / 114" x 102" x 523"	2926131	2900 x 2600 x 13100 mm / 114" x 102" x 516"
32	2826145	2900 x 2600 x 14500 mm / 114" x 102" x 696"	2926177	2900 x 2600 x 17700 mm / 114" x 102" x 697"

Service without borders

– you can count on our commitment

A service agreement with Getinge gives you peace of mind. Our global service network provides expert preventive, predictive and reactive maintenance to help you maximize uptime and safety – and to keep your operations running smoothly.

A good relationship is built on trust and we are committed to serving your needs wherever you are in the world.

With our Service Team by your side, you are ready to meet the requirements of accrediting organizations and government regulatory agencies.



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