

Technology for Water

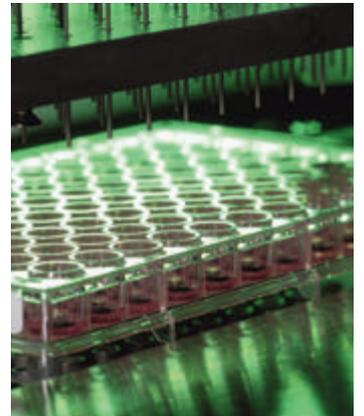
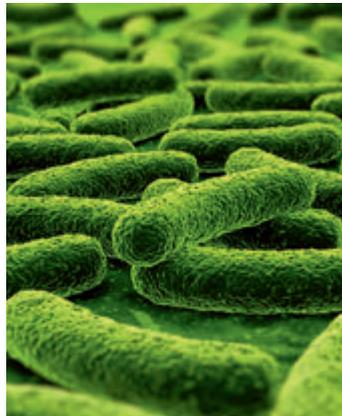
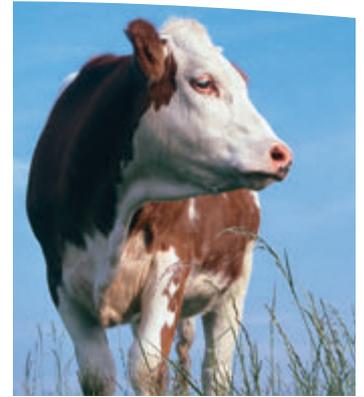


ENVIROCHEMIE



THERMAL WASTEWATER INACTIVATION AND STERILISATION





STERIFIX – RELIABLE TECHNOLOGY FOR THERMAL WASTEWATER STERILISATION AND INACTIVATING

EnviroChemie offers intelligent solutions for reliable and decentralised wastewater treatment in biotechnology and healthcare facilities. These effluents are commonly characterised by their high or very high biohazard risk. Our SteriFix effluent decontamination systems (EDS) are optimal for laboratories (even containment level 3 and 4 laboratories), universities, research facilities, industrial applications (e.g. pharmaceutical industry), government agencies (e.g. animal disease control agencies) and healthcare facilities.

SteriFix plants are designed to safely inactivate, sterilise or disinfect wastewater containing infectious or genetically altered materials via thermal sterilisation. Temperature sensitive pharmaceuticals and vaccines can also be inactivated using our technology. Equally microorganisms and bacteria are eliminated in this process, while at the same time viruses, plasmids and DNA fragments can be deactivated. SteriFix effluent decontamination systems additionally ensure optimal inactivation and/or sterilisation output with the most efficient energy input.

More than 35 years experience and expertise based on approx. 1,000 reference installations combining the advantages of innovative and proven technology with flexible process control.



SteriFix C500/2S with steam generator (built as a modular plant in ISO shipping containers) at the State Office for Food Monitoring and Consumer Protection in Rostock, Germany



Detail of the top of a Sterifix C2500/2S at the Friedrich-Loeffler-Institut in Jena, Germany

STERIFIX C – BATCH BIOTECHNOLOGY FOR SAFE WASTEWATER STERILISATION

SteriFix C wastewater treatment plants are ideal for volumes ranging from 100 l per batch up to 20 m³ per day. By using the SteriFix batch technology, an optimal retention time and a sterilisation temperature up to 180°C can be reached, thereby achieving very high inactivation effectiveness.

Top energy efficiency is achieved by implementing a special equipment design using the most modern process technology, which includes the combination of two double jacketed vessels.

Thanks to this, the heat from large volumes of wastewater can be recycled, and the cooling requirement to achieve the discharge temperature (sewer) is reduced. Additionally, the safety of the system is improved through in-built redundancy. Nevertheless, in situations where very limited space is available, a single container system can also be implemented.

Since safety is always our top priority, a sterile filter is installed in the air vent to guarantee that the exhaust air leaving the plant is sterile. In addition, a design which avoids dead volumes thanks to an in-built magnetic stirrer or circulation pump ensures the safe sterilisation of every single drop of water.

Characteristics:

- Flexible operation with free choice of inactivation temperature and time
- Low operating and investment costs
- No risk of bacterial contamination of treated water
- The plant can be operated under pressure, so no additional pumping station is needed
- Sterile exhaust air
- Complies all EU standards
- Ideal for inactivation of wastewater containing solids
- Easy validation
- Safe sterilisation procedure
- Wastewater volumes up to 20 m³ per day
- Avoidance of cross contamination of streams through leakage control
- Plant can be completely sterilised

Technical performance:

- No dead volumes (100% safe sterilisation)
- Temperature and time are variable and are monitored throughout the process
- Electrically heated sterile air filter
- Pneumatic draining, i.e. no need of pumping station
- No clogging thanks to double jacket technology and steam injector
- Siemens SPS S7 control system
- Output temperature < 35°C
- Plug valves without dead volumes
- High operational safety due to redundant plant design

STERIFIX E



SteriFix E200 (200 l/h, 121°C, 20 min.) at Wacker Biotech showing the heat exchanger and the holding section – covered by insulation casing



SteriFix E15000 (max. 15000 L/h, 80°C, 80 sec.) at Merck Serono GmbH for factory acceptance test

STERIFIX E – CONTINUOUS AND RELIABLE WASTEWATER STERILISATION

SteriFix E wastewater treatment plants are ideal for treating volumes of continuously inflowing wastewater from 100 l/h to 15 m³/h. Using the EnviroDTS continuous process technology, the energy needed for sterilisation can be minimised by means of an effective heat recovery system.

Incoming wastewater is firstly pre-heated using the heat extracted from the disinfected effluent leaving the plant. Directly after that, it is warmed up to the temperature required for sterilisation using a steam injector. Due to this effective heat exchange between outlet

and inlet, the temperature required at the point of discharge can be reached without any additional cooling. The inactivation process is monitored and regulated by the retention time and the output temperature. A sterile filter on the air vent ensures the sterility of the exhaust air. A design without dead volumes guarantees safe sterilisation at low operating costs. Robust and reliable equipment design results in a high level of plant availability.

Characteristics:

- Flexible (continuous) operation
- Energy efficient
- Reduced operating costs due to minimised energy consumption
- Minimal space requirements
- No risk of bacterial contamination of treated water
- Spiral heat exchanger implementation means no sensitivity to presence of solids in the wastewater
- Sterile exhaust air
- Complies with all EU standards
- Safe sterilisation procedure with special measurement of time spent in holding section
- Wastewater volumes up to 15 m³ per hour
- Avoidance of cross contamination of streams through leakage control
- Plant can be completely sterilised

Technical Performance:

- Compact design
- Efficient heat recovery system
- No dead volumes (safe sterilisation)
- Leakage monitoring of the heat exchanger
- Monitoring of temperature and retention time
- Low operating cost thanks to optimal heat recovery
- Very low noise level
- Electrically heated sterile air filter
- Spiral heat exchanger for wastewater containing solids available as an option
- Siemens SPS S7 control system
- Output temperature < 35°C
- Stand-by running prevents system cooling down. No initialisation time needed for resuming normal operation.



TDS 60 decentralised thermal sterilisation system equipped with a chamber (60 litres).



SteriFix C500 Compact sterilisation plant ready for shipping

TDS UNITS FOR DECENTRALISED WASTEWATER THERMAL STERILISATION

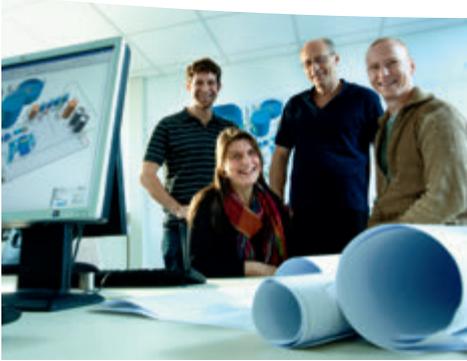
Decentralised sterilisation systems of this type are used, for example, in S3 and S4 security laboratories. In these laboratories, wastewater has to be inactivated before it can be discharged following very strict safety regulations. TDS 60 and TDS 30 twin are the optimal solutions for flexible and decentralised wastewater sterilisation within the laboratory. They avoid long and unsafe transport paths to a centralised treatment system.

COMPACT BATCH INACTIVATION PLANT – STERIFIX C100 AND C500

For decentralised inactivation of rather larger volumes, our smallest SteriFix plants – the SteriFix C 100 and C500 – are the optimal solution. Wastewater volumes free of suspended solids of up to 1,000 litres per day can be inactivated using these units. They have a double jacketed steriliser with electrical heating. A magnetic stirrer ensures thorough mixing. After sterilisation is complete, the sterilised wastewater is cooled by the water jacket.

Specifications of TDS units:

- Stainless steel sink with a touch-free faucet
- Fully automatic system with a status indicator on the display, e.g. procedural step, error message, date/time and limits
- Documentation ability with a 4-point-matrix printer, 20 characters per row for a hardcopy of the batch number, date, time, sterilisation parameters, etc.
- Fully automatic filling and automatic program start for the sterilisation
- Sterilised wastewater is automatically drained and cooled (< 50°C) before being discharged to the sewage
- Floor collecting pan with a moisture indicator and an automatic water shutoff
- TDS 30 twin can be operated continuously, since it is equipped with 2 autoclaves, which can sterilise alternately
- Pneumatic valve with no dead volumes
- Level gauge and signal at a residual amount lower than 10 litres
- Oil-free and dust-free pressurised air at 6 bar



ENVIROCHEMIE'S SCOPE OF PERFORMANCE

EnviroChemie is an engineering company offering a full range of services based on our long international experience.

At EnviroChemie we are always focussed on our customers and assist them with the design, engineering, construction and commissioning of our plants. We always work in close partnership with our customers.

- Design
- Laboratory tests and pilot trials
- Plant construction
- Factory acceptance test
- Final assembly and commissioning
- Plant optimisation
- Process optimisation
- Research & Development
- After-sales service

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