



Medical waste sterilization system



Medical waste treatment system
offering complete environmental
security at the most competitive prices

MEDICAL WASTE STERILIZATION SYSTEM

We provide a wide range of innovative functions and services, as maintenance monitoring of our systems, telemanagement service, control panel and much more.



Medical waste advanced technology

Currently, sanitary care providers have few choices for the safe disposal of infectious medical waste.

Following to the variations in disposal costs, the rewriting of the rules for environmental protection, as well as the growth and cuts of medical facilities, a new method has emerged:

ECOSYST, the system combining an effective sterilization technology with **HIGH PRESSURE SATURATED STEAM** to accurate computer checks.

ECOSYST offers the cheapest Prices and guarantees to save your money in 5 ways:

1. Labor

Automation reduces the hours of work required for handling hazardous waste more than other systems. Our plant is fully automatized and the action of the operator is required for the sole loading of waste into the cart; subsequently an electric system will lift and send the cart into the loading hopper.

2. Operator safety

Several steps in the handling of infected waste like syringes, needles, etc. may be the cause of unpleasant incidents. Our automated system for lifting and loading decreases risk of accidental needle sticks and, primarily prevent from the contact with organic and liquid substances. The results: reduction of lost hours and more safety at cheaper costs.

3. Spare parts

Other alternative systems have high and sometimes hidden costs for spare parts like special bags, chemicals and other supplies available only from authorized dealers. The ECOSYST facility ECO-S series does not require special stocks, but is designed so that you can find spare parts anywhere in the World.

4. Disposal

The waste leaving the ECOSYST facility ECO-S series, turned into sterile and reduced in fine size, can be easily packaged, temporarily stored and directly delivered to RDF/[CSS] facilities. Such facility will exploit its high calorific value to improve the quality of their fuel.

5. Compliance with environmental protection

Our facility eliminates the unforeseen costs linked with environmental protection regulations. Beside, a thorough protection from risks of liability met by waste producers in passing infectious state is avoided, eliminating waste from hand to hand can be achieved. Above all, the use of the INCINERATOR is avoided eliminating atmospheric emissions of hazardous and noxious substances deriving from the combustion process.



COMPLETE ENVIRONMENTAL SOLUTION

HIGH PRESSURE SATURATED STEAM: the ECO-S SERIES

plant complies with the European Union PED directive, as well as the Machinery Directive for moving elements.



*The **SERIES ECO-S** plant does not emit harmful substances to the atmosphere and turns infected waste into a sterilized and unrecognizable material, safer than solid urban waste.*

***ECOSYST** represents a complete and technologically innovative solution.*

High convenience and ease use

The system can be installed both indoor and/or outdoor and requires only electrical and hydraulic connections for its operation.

The facility is completely automated; the loading cart starts the phase of waste preparation for subsequent transfer to the sterilization phase. The outgoing waste is discharged to the other end of the facility into a container and can be compared to solid urban waste.

Reliability

The companies in the medical waste sector are highly demanding due to the fact that their profits depend on the continuous costs of operation, reliability and duration of the treatment systems.



INSIDE THE STERILIZATION PROCESS

The sterilization treatment process uses **HIGH PRESSURE SATURATED STEAM**, a widely accepted principle for treating infectious medical waste.

THE PROCESS: DESCRIPTION OF THE MEDICAL TREATMENT

The facility is equipped with a loading cart that can be loaded from the top cycle automatically, by introducing in the inside “As-is” disposable containers and/or the content of the reusable containers. The loading of the cart starts the **phase of waste preparation** in view of the subsequent transfer to the **sterilization phase**. The two phases are batch processes which can occur simultaneously. In other words, during the process of sterilization it is possible to start the preparation of a new waste loading phase.

THE AUTOMATED CYCLE OF WASTE PREPARATION

LOADING

The infected waste, loaded inside the entering cart (2) following to an initial weighing (1), is lifted and overturned (3) into the hopper (4). After the loading operation, the hopper is closed before the starting of the subsequent phase.

SHREDDING

The shredding takes place by using a 4-axis knives shredder (5) equipped with an automatic anti-blocking system. The waste is discharged under the shredder through a grid that allows to obtain the desired size. During the operation, a sodium hypochlorite solution is sprayed inside the loading hopper to sanitize the hopper itself and to reduce rising of dust.

ACCUMULATION

The shredded waste is accumulated into a storage compartment (6) that feeds the transfer screw (7) to the sterilization chamber (8). The storage compartment, in addition to homogenising the shredded load, regulates, through filling sensors, the introduction of new waste to the hopper.

FILTERING BATTERY

The automatic preparation cycle is obtained by keeping the loading hopper in depression state so as to avoid the escape of emissive components. The flow aspirated by the filter group (10) is treated through:

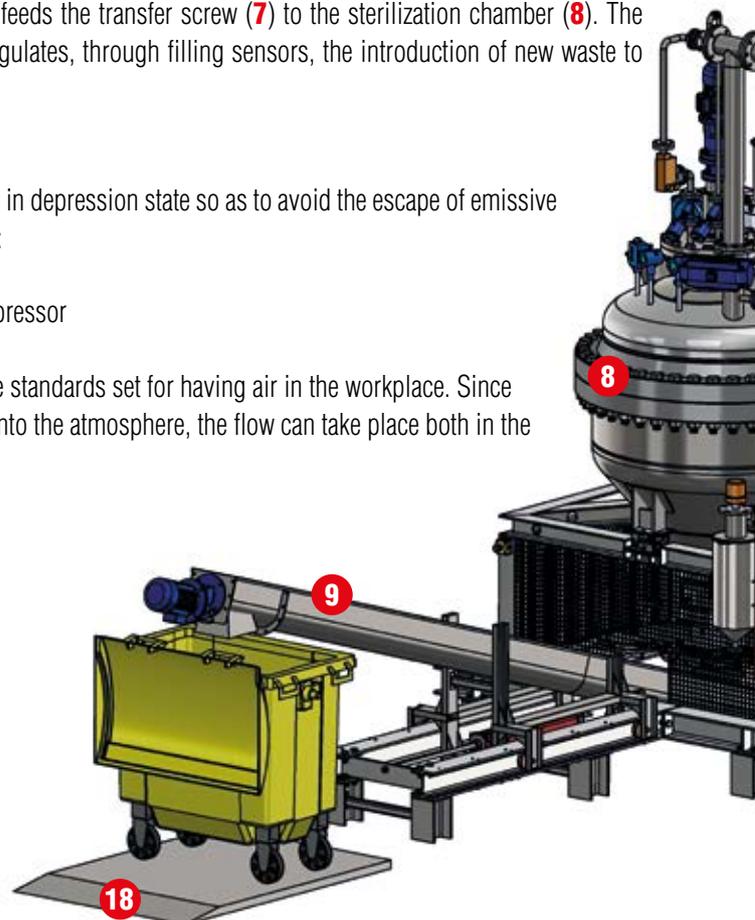
- Pre-filter
- HEPA filter
- Activated carbon filter
- Centrifugal compressor

This emission treatment system allows to obtain a flow complying with the standards set for having air in the workplace. Since the said standards are more restrictive than those required for emissions into the atmosphere, the flow can take place both in the environment where the system is installed and outside.

THE STERILIZATION AUTOMATED CYCLE

TRANSFER

The waste accumulated inside the store compartment is transferred to the sterilization chamber via screw conveyor. The screw has been designed in order to carry the entering waste. The filling sensors, connected to the storage compartment, allow the complete emptying to be verified by a control PLC (14) which allows the management of the solenoid valves through a pneumatic circuit driven by a compressor (17).



STERILIZATION

Once the waste transfer process ends, the sterilization chamber can be closed by means of a specially designed shut-off valve and the thermal cycle can start. The saturated steam produced by the steam generator (12) is fluxed into the waste, where the waste are kept in motion by a spiral stirrer. The combination of fluxing and penetration allows the saturated steam to penetrate throughout the whole mass under treatment. Through the said system it is possible to reach, within the mass of treated waste, the maximum conditions obtainable, equal to 165°C with a pressure of 6 bar, allowing a reduction of the bacterial load such as to guarantee a S.A.L. (Sterility Assurance Level) not lower than 10⁻⁶, as evidenced by the efficiency test issued by the University of Bari. The time / temperature conditions of the automatic cycle are defined during the configuration of each individual single system according to: type of treated waste, humidity level, operating potential, etc.

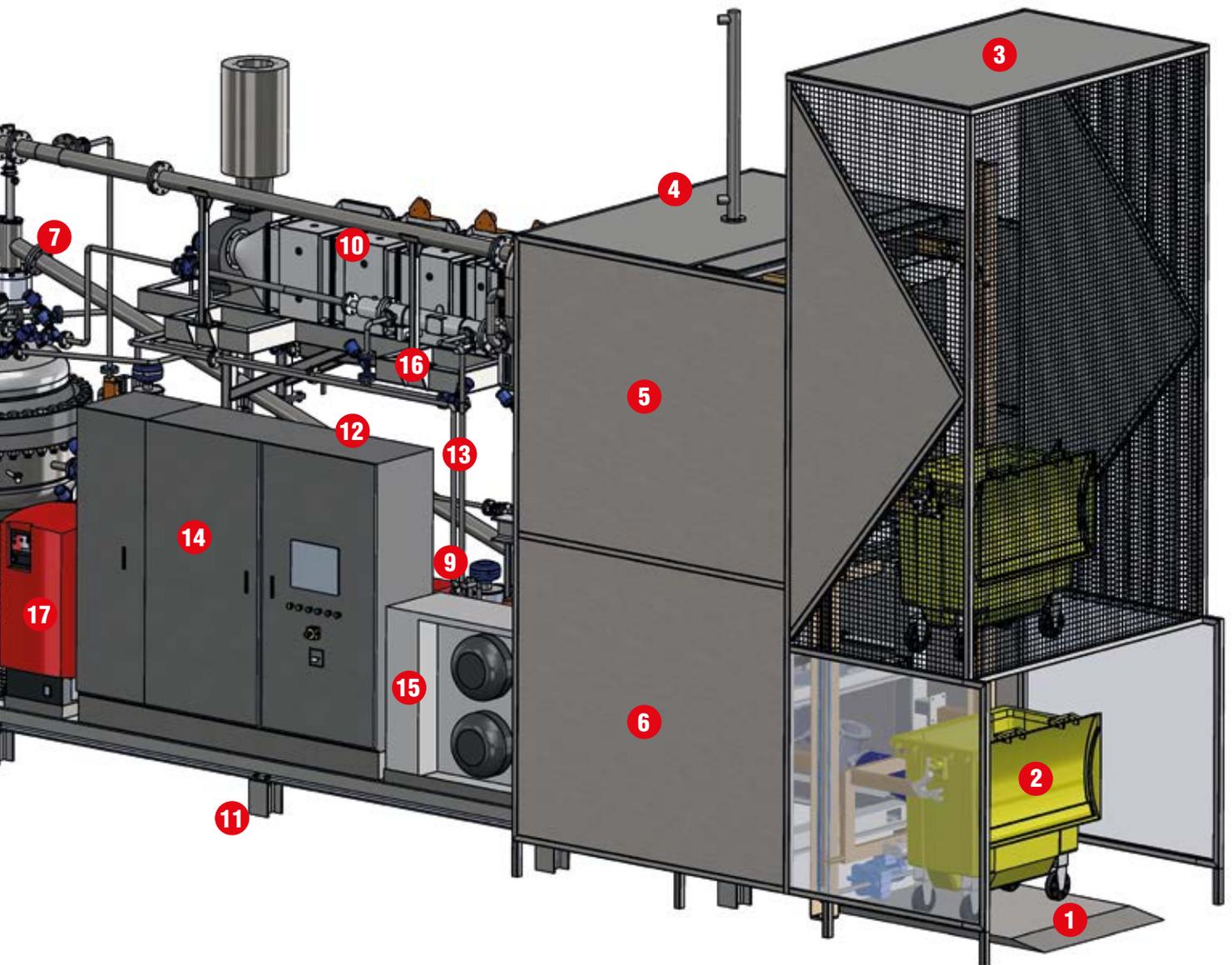
Moreover, within the sterilization chamber, a housing is provided where the bio-indicators will be introduced in the form of vials containing a strip of spores of *Geobacillus Stearothermophilus* useful to comply with the provisions of UNI 10384/94.

After the sterilization phase, the chamber is returned to atmospheric pressure (13) through a valve suitable for the steam outlet, which is recovered and condensed (16) by means of a chiller (15). This allows the re-use in the following cycles. Subsequently, a depression is created allowing the evaporation of residual moisture. This evaporation also implies a cooling of the waste.

STERILIZED REFUSAL DISCHARGE

Before proceeding with the discharge of the sterilized waste, an appropriately designed auger (9) is located automatically, by means of PLC management, under the sterilization chamber to receive the waste in exit. The auger is then activated to transfer the waste into a final container. Once the unloading phase is complete, the auger returns to the initial position. The process is completely managed by a PLC.

The plant is installed on a self-supporting frame (11) made of steel sections, allowing a simple and quick installation. It has a size of about 1170W x 710D x 600H (cm), with a consumption for a variable treatment cycle depending on the types and amount of waste treated.



ADVANCED TECHNOLOGY FOR ENVIRONMENTAL EFFICIENCY

ECOSYST is committed to research every day, to reduce the environmental impact to ZERO, using an innovative and safe process for medical waste management.



SAFETY

- Plants complying CE regulations
- Cross and automatic checks eliminate the dangers
- Automatic lifting eliminates accidents
- Sterilization level higher than microwaves

BENEFITS

- Easy to install
- Hydraulic and electric connections only
- Reinforcement of the eco - sustainability image
- Life of the facility: over 10 years

TECHNOLOGY

- Powerful shredding technology
- Ideal technology for hospitals and commercial facilities
- Fully automated plant (PLC)
- Air treated with absolute filtration

ECONOMY

- Competitive investment for high productivity
- Low operating costs
- Reduction of storage and handling costs
- Only one operator can check more plants

EFFICIENCY

- Sterility level not less than 10⁻⁶
- 80% volume reduction
- 30% weight reduction
- Dry and potentially reusable waste

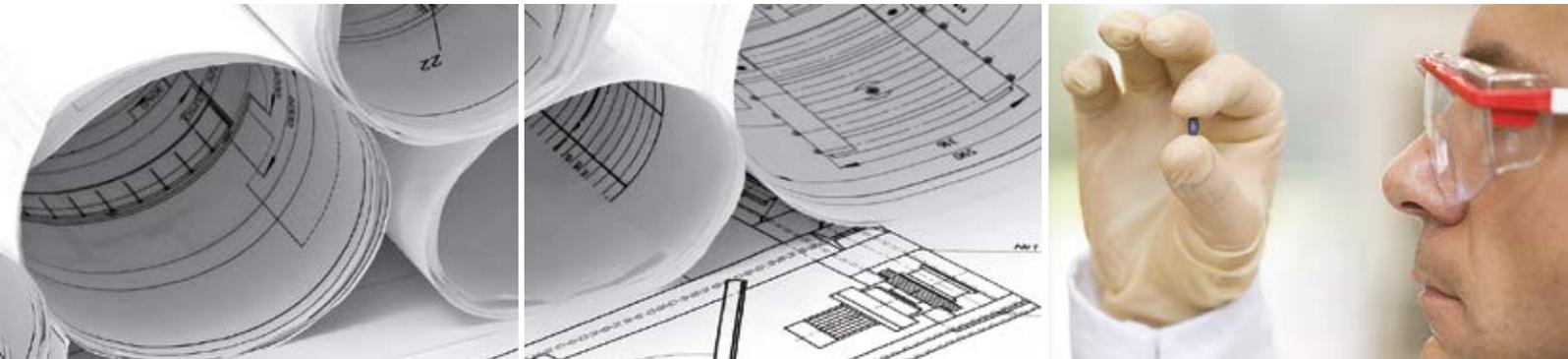
ENVIRONMENT

- No atmospheric pollution
- No contaminated liquid
- No waste liquid at the end of the cycle
- No odours



CERTIFICATIONS AND TEST PERFORMED

*In many Countries there are several existing laws, which must be respected when potentially infected waste is processed.
Italian legislation keeps one of the strictest regulations in the world in the field of infectious-risk medical waste.*



PURPOSE

The **ECO-S SERIES** facility has the strategic target of responding to the stringent regulations on the management of medical waste belonging to the European Waste Catalog (**EWC**), using modern technology applied to a highly automated technological process.

TESTS CARRIED OUT AND CONFORMITY

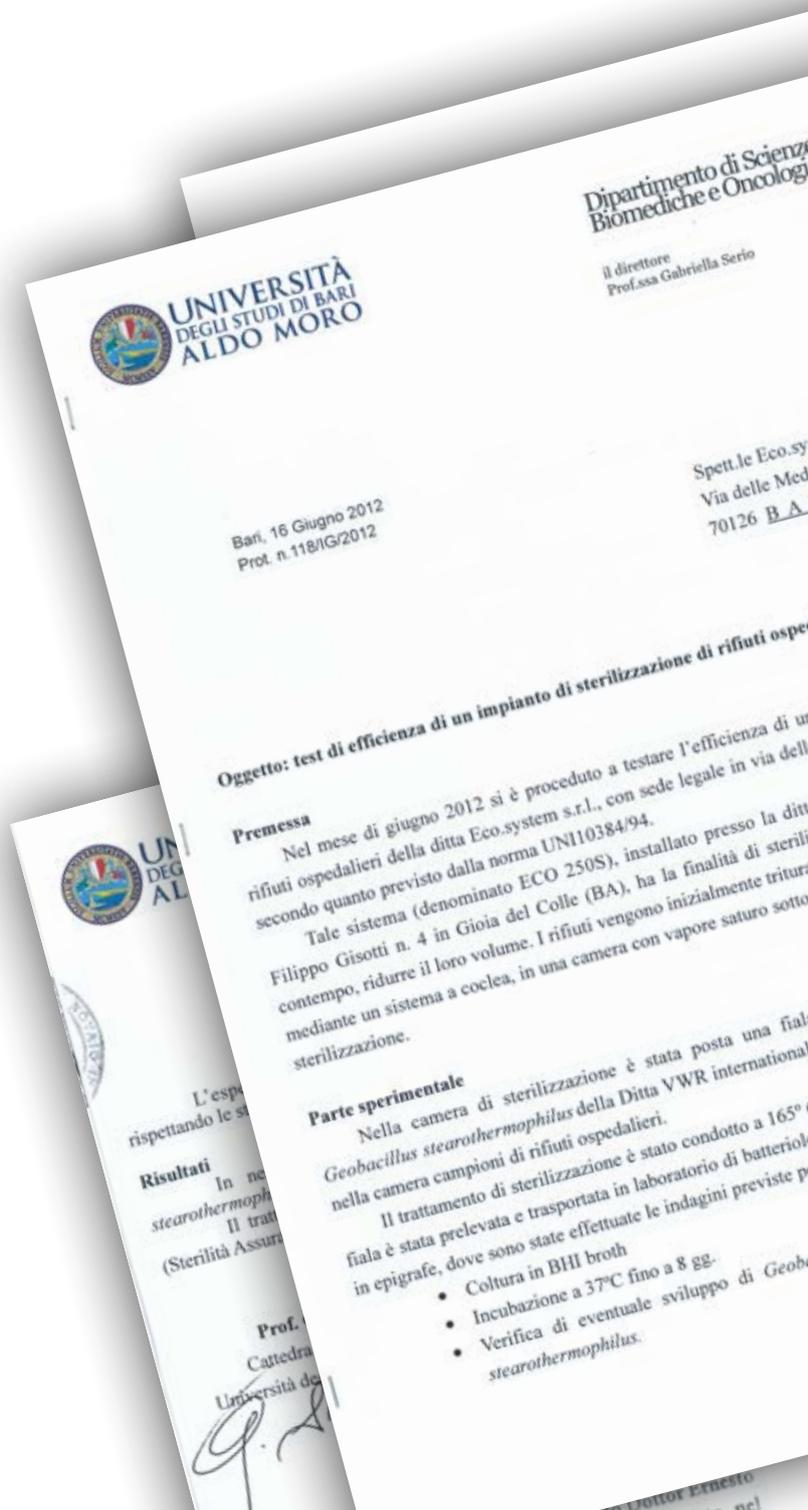
The facility, in addition to its compliance with the provisions of the D.P.R. 254/2003 and the associated UNI 10384/94 norm, has been subjected to:

Advice by the Institute for Environmental Protection and Research (ISPRA - Italian research body which is used in the Ministry of the Environment) in which it is highlighted that the only treatment with high pressure saturated steam is sufficient for the sterilization of medical waste with an infectious risk.

Test carried out by the Department of Biomedical Sciences and Human Oncology of the University of Bari "Aldo Moro", which confirmed compliance with the provisions of the law UNI 10384/94.

Test by the Laboratory "Environment Center" of Bari.

Beside the aspects strictly linked to the effectiveness of the sterilization process, the sterilization chamber complies with the Directive 2014/68 / EU - PED for pressure equipment and the whole facility complies with the 2006/42 / EC Directive - Machinery Directive.





CONTACTS

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ECOSYST is the registered trademark, used in the website as well as the name of the technology.
ECO.SYSTEM S.u.r.l. is the business name of the company.