

## TESALYS STERIPLUS™ 80

### BIOMEDICAL WASTE SHREDDING & AUTOCLAVING/STERILIZATION SYSTEM

#### PRODUCT SPECIFICATIONS



#### INTRODUCTION

Disposal of biohazard waste is not easy. It implies risks for the environment and the personnel not to mention high collection, transport, and incineration costs. The producer is responsible for the waste until it has been completely destroyed. Disposal must also comply with local procedures and regulations.

#### STERIPLUS™ 80 PRESENTATION

Tesalys system STERIPLUS™ 80 is the ideal solution to transform infectious waste into safe, household waste. The system includes volume and weight reduction by shredding and a 6 log<sub>10</sub> microbial reduction (8 log<sub>10</sub> reduction of bacterial spores) thanks to a 135°C autoclaving/sterilization process.

The STERIPLUS™ 80 addresses the needs of healthcare centers, laboratories and all other locations where biomedical waste is produced. It can process waste bags, cardboard or plastic containers containing all kinds of surgical, medical, and domestic healthcare waste, sharps, gloves, labware, glass, plastic/rubber tubing, and filters. It can also manage a large volume of liquid waste.

The STERIPLUS™ 80 has been designed to be used, either individually in its basic version, or as a group and in this case, several units can be juxtaposed in order to obtain a higher throughput.

#### APPLICATIONS

The STERIPLUS™ 80 is an **advanced solution to make biomedical waste safe** which modify its appearance and reduce risks, volume & weight, and disposal costs. The STERIPLUS™ 80 is specially designed for the treatment of infectious waste produced in the following facilities:

- Hospitals, clinics and outpatient surgical centers.
- Ambulatory care centers, dispensaries.
- Dental offices, Medical centers.
- Homecare centers.
- Dialysis & transfusion centers, blood banks.
- Clinical laboratories.
- Life Science Research & Public Health laboratories.
- Pharmaceutical R&D labs.
- Biotech & Vaccine production facilities.
- Animal Care & Research facilities.
- Biocontainment facilities.
- Agricultural & food laboratories.
- Public facilities, transportation care centers.
- Civil & Military ships and aircrafts.
- Prisons & detention centers.
- Waste management service providers.



## KEY FEATURES OF STERIPLUS™ 80

The STERIPLUS™ 80 has been specifically designed to be installed as close as possible of the source of production of infectious waste, thus reducing storage / transport and elimination related risks. The key features of the STERIPLUS™ 80 are:

- 1- **6 log<sub>10</sub> reduction** validated process by steam sterilization at 135°C (8 log<sub>10</sub> reduction of bacterial spores).
- 2- **Waste introduction chamber:** automatic steam decontamination between cycles.
- 3- **Shredder feeding system:** totally tighten and automatic, with level detection .
- 4- **TESASHRED™ shredder:** unique shredding system transforming waste into unrecognizable 8-10 mm. pieces.
- 5- **Solid waste reduction** by up to 80% in volume, by up to 50% in weight.
- 6- **Liquid waste/effluents** decontaminated before disposal to sewer.
- 7- **Exhaust air filtration** by 0.2 µm filter.
- 8- **Water softener & booster pump, air compressor** included.
- 9- **Water pre-filtration** system.
- 10- **Ventilation of the electrical cabinet.**
- 11- **Full cycle traceability** via printer.



## PROCESS DESCRIPTION

After the loading of waste in the shredding chamber, **the process is fully automated and secured** and the operator has no other manual operation until the unloading of the decontaminated waste.

### a) Top Door opening

Loading door is located on top, it **slides horizontally and automatically** towards the left side of the unit.

### b) Safe loading of waste in shredding chamber

Waste is manually introduced into the shredding chamber by the operator. The loading chamber has an opening section of 370 x 360 mm. (width x depth), and a usable height of 630 mm. enabling the loading of multiple waste bags, cardboards or plastic containers.

The loading/shredding chamber is made in stainless steel 304 L. The chamber design eases the cleaning of the chamber walls whenever necessary.

Door is closed **automatically**.

### c) Shredding (waste size around 8 mm.)

Before starting the cycle, the door is locked and the process cycle may start with the shredding of the waste.

The TESASHRED™ shredder is specially designed to process biomedical waste materials. Robust and effective, after shredding the waste will be cut in unrecognizable pieces not bigger than 8-10 mm.

The cutting blades move alternatively forward and backwards at the speed of 10 rpm, and in case of blocking, the movement is automatically reversed.

Waste is pushed into the shredder by means of a PTFE plate which goes down automatically. Level of waste in the shredding chamber is displayed as a bar graph on the control screen.

Shredded waste falls by gravity into the thermal process decontamination chamber. Liquids will also flow by gravity into a specific sump at the bottom of the decontamination chamber, where they will be processed before discharge.

After the shredding, volume of solid waste is reduced up to 80% depending on the type of waste.

**d) Decontamination process 135°C, 10 or 20 min.**

The decontamination process is a typical autoclaving/sterilization cycle with the following steps:

- **Prevacuum** for air extraction by means of a vacuum pump. The air is very easily extracted from the shredded waste, this will facilitate steam penetration and homogeneity of temperatures during the decontamination holding time. During this phase, condensates are blocked in the decontamination chamber. Air extracted is considered to be potentially contaminated, so it is filtered by a 0.2 µm filter before exiting the chamber.
- **Heating:** steam produced by the built-in steam generator is injected to heat up the chamber and the solid and liquid waste. Injection is made by the lower part of the chamber, and temperature control probe is in the upper part, so that to make sure that steam has flowed through and heated the liquid and solid waste.
- **Decontamination (sterilization) at 135°C, holding time 10 or 20 min** (holding time can be adjusted according to local requirements). During this phase temperature is homogeneous in all parts of the processing chamber to guarantee the decontamination of the solid waste (in the upper part of the processing chamber). Liquids are stored in the sump until the end of the decontamination phase, thus being equally thermally treated. They will be released to drain only after the end of the cycle.
- **Cooling and return to atmospheric pressure:** steam is released from the unit until reaching the atmospheric pressure. Steam is condensed, cooled and evacuated to drain. Decontaminated liquids are equally cooled down and evacuated to drain.

**e) Opening of the side door and unloading**

Unloading is done by the door located on the right side of the unit. At the end of the cycle, operator unlock the door on the HMI. Door slides upwards manually (or automatically if option "Unloading door automatically operated" is ordered).

Solid waste can then be taken out of the chamber for disposal. In most cases, processed waste can be sent to the local household waste circuit. However, disposal circuit maybe subject to local regulations, it

is up to the end user to make sure that the right circuit and procedures are used.

**f) Leak test and next cycle**

Before closing the unloading door, the operator must acknowledge the end of the cycle on the control panel. After closing the unloading door, an automatic leak test will be run to make sure that the machine is ready to start a new cycle.



## CONTROL SYSTEM & TRACEABILITY

The unit is fully controlled by a PLC (programmable logic controller).

The user interface (HMI) is a color touch screen.

During the cycle, the screen displays all necessary information for the operators, amongst others:

- Instructions for loading, unloading.
- Level of waste in the shredding chamber.
- Temperature and pressure in the decontamination chamber (values and graphs).
- Status of the cycle, end of cycle.
- Alarms and errors.

Traceability is ensured by means of a printer. Printer ticket is generated automatically all along the cycle, and the following information is recorded:

- Date, time and number of cycle.
- Temperature and pressure during the decontamination phase (every minute).
- Cycle completion (OK or not).

The PLC can store the data corresponding up to 100 cycles in the internal memory. Data can be downloaded into a USB stick or transferred via modem to another location.

## ENVIRONMENTAL FEATURES

- Reduction of waste footprint: Solid waste reduced by up to 80% in volume, by up to 50% in weight.
- “Clean” effluents: thermal decontamination prior to discharge.
- “Clean” air: exhaust air filtration by 0.2 µm filter.
- Very low water and energy consumptions.
- Energy savings by heat recovery system.
- No chemicals used, just water.



## QUALITY STANDARDS

The STERIPLUS™ 80 is CE marked and has been specifically designed to meet one of the most restrictive standards for waste decontamination units (French standard NF-X30-503-1).

Qualification of sterilization cycle has been done according to international standards EN 554 and EN ISO 17665-1.

## OPTIONS & ACCESSORIES

- Start-up kit.
- Maintenance parts kit for 1 year.
- Emergency Spare Parts Kit.
- New Waste Unloading System: TesaXtract™.
- Full Traceability & Full Remote Access.
- Effluent Cooling System.
- Virus+ special cycle against viruses.
- Special packaging.

## CONSUMABLES

For a clean decontamination chamber, Tsalys highly recommends the use of heat-resistant waste bags (like autoclavable bags), cardboard containers or plastic containers containing waste to process. Tsalys offers a range of consumables suitable for the STERIPLUS™ 80:

- Tesabag: Red and yellow biological waste bags (autoclavable bags).
- Tesabox: Cardboard containers adapted to the size of the loading chamber.
- Tesanet: Cotton net for easy unloading.

## TECHNICAL DATA

STERIPLUS™ 80	
Capacity	80 l. / cycle
Useful loading chamber dimensions (h x w x d)	628 mm. x 360 mm. x 370 mm.
Total cycle time (NF X30-503-1 standard)	30 to 35 min
Total cycle time In working conditions	30 to 50 min
Loading capacity (kg/cycle) <i>Based on an average waste density of 0,08 to 0,12kg/L for HealthCare Waste</i>	6,4 to 9,6 kg/cycle
Loading capacity (kg/cycle) <i>Based on an average waste density of 0,12 to 0,2kg/L for Lab/Humid/Liquid Waste</i>	9,6 to 16 kg/cycle
Treatment capacity (kg /h) <i>Based on an average waste density of 0,08 to 0,12kg/L for HealthCare Waste</i>	8 to 12 kg/h
Treatment capacity (kg /h) <i>Based on an average waste density of 0,12 to 0,2kg/L for Lab/Humid/Liquid Waste</i>	12 to 20 kg/h
Maximum quantity of liquid recommended per cycle	24 L
External dimensions (h x w x d)	1800 x 1550 x 1200 mm.
Net weight	1300 kg
Treatment chamber	Stainless steel AISI 304L
Steam generator	Stainless steel AISI 304L (chamber) & Highly corrosion resistant Hastelloy®
Water softener, water booster pump, air compressor	Built-in
Shredder	Structure: AISI 304L stainless steel & Blades: High-strength steel
Piping	Stainless steel / PTFE flexible hosing
Chassis	Painted steel
Bodywork	Composite material/painted steel
Cycle traceability <i>Through printout</i>	Built-in
USB port	Built-in

## UTILITIES & INSTALLATION REQUIREMENTS

STERIPLUS™ 80	
Water (requirements)	Softened or drinking quality water
Water (consumptions)	Approx. 15 liters/cycle
Electricity (requirements)	380–400V III N, 50 Hz/60 Hz, 20 kW
Electricity (consumptions)	8 kWh/cycle
Drain	32 mm ø internal (heat-resistant) (1.2")
Steam / compressed air	Produced by the integrated generator and compressor; no external connection required
Noise level	< 60 dB