

# ACHIEVING SUSTAINABLE HEALTH CARE WASTE MANAGEMENT

## Part 3 - Facility-Level Activities: Managing Health Care Waste

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**Tuesday, February 20**

**9:00 WAT / 11:00 EAT / 15:00 ICT**

This three-part webinar series, hosted by UNICEF and GAVI in association with TechNet-21, will orient participants on the key actions needed to address health care waste. Session 3 will address facility-level activities including assessments and capacity building required to appropriately managed health care waste.



# Agenda

## 01. Gavi Maturity Model & Guidance for Proposal Planning

## 02. Featured Manufacturers: Operations & Maintenance, Capacity Building, Training, and Decommissioning (w/ Q&A)

- Bertin
- Ecosteryl
- Newster
- Tesalys

## 03. Recap of HCWM Technical Series and Upcoming Capacity Strengthening

# 01. Gavi Maturity Model & Guidance for Proposal Planning

Health Care Waste Management Maturity Model

# HEALTH CARE WASTE MANAGEMENT BEYOND IMMUNISATION PROGRAMS: GUIDANCE FOR PROPOSAL PLANNING

Overview of Guidance Document

# HEALTH CARE WASTE MANAGEMENT IN IMMUNISATION PROGRAMS: GUIDANCE FOR PROPOSAL PLANNING

GUIDANCE DOCUMENT



How HCWM is linked to iSC2 Strategy & introduction to the Guidance

# Introduction



# iSC2 Strategy highlights HCWM as an investment priority

## How the iSC Strategy 2021-2025 is linked to Waste Management

### Areas of Opportunity within the Investment Priorities

Data visibility and use	Capacity development and professionalization	Fundamental infrastructure	Strategic planning	System optimization and segmentation	Smart integration and harmonization
Digitize and integrate information systems (eLMIS, Barcoding, Track & Trace)	Supply chain competencies and structures	Continue support to maintain adequate CCE capacity	Conduct comprehensive supply chain planning	Continuously review and optimise existing systems	Conduct analysis and identify opportunities for integration
Collect, analyse, and use data	Strengthen and apply skills	Integrate temperature and other SC data	Consider various financing approaches	<b>Improve processes, from forecasting to waste management</b>	Develop guidance and evidence for integration
Active vaccine & syringe stock management, including wastage tracking & mitigation	Identify effective incentives & motivators	Invest in appropriate SC resources, either building capacity or outsourcing	Strengthened national and subnational governance mechanisms	Apply approaches from other settings and sectors	Connect broad community of SC actors at national and sub-national levels
Establish a monitoring & accountability framework	Create healthy work environments			Strengthen data-driven forecasting and agile supply planning	

System optimization and segmentation is situated within the iSC 5.0 strategic vision, and one of the focus areas is waste management

Gavi's Immunisation Supply Chain Strategy highlights the importance of Health care waste (HCW) as a growing concern across all health areas, including immunisation.

Despite most countries having adopted WHO standards and international agreements for HCWM policies are often not strictly followed

Research<sup>1</sup> indicates insufficient adherence to good HCWM practices in many places.

<sup>1</sup>Udofia E., Fobil J., and Gulis G., "Solid Medical Waste Management in Africa," African Journal of Environmental Science and Technology 9 (March 30)

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Low level of awareness of risk associated with HCW (less than 40%)	Moderate awareness of risk associated with HCW; curriculum developed but not fully rolled out (implemented in 41%–50% of facilities)	A significant proportion of health workers and waste handlers (51%–75%) are trained on the risks associated with HCW and clear guidance on HCWM is available at most facilities	High level of awareness of HCW risk. 76%–85% health care workers and waste handlers have undergone training and have access to on-going training
Little insight into the practice of best practices for HCWM	Have insight and best practice of HCWM (SOPs and job aids) but not fully practiced (less than 50% of facilities adhere and comply)	Most HCWM being adhered to by most of the facilities; M&E in place.	Significant compliance to the best HCWM practices. M&E framework in place with some tracking of adherence
Policy is needed but is currently not being developed. No recent HCWM assessment carried out (within the last 5 years)	Policy developed and/or reviewed within the last 5 years. HCWM assessment carried out within the last 5 years	Policy and guidelines are partially implemented	Country can show that the policies and guidelines are fully implemented at all levels of the system
HCWM is not planned or budgeted	Budgeted but not linked to realistic assessment findings	At least half of facilities have developed a HCWM budget and	Budgets are available, funded and tracked at 75% of system levels
Guidance is not available, or currently being developed	Guidance developed but not fully in use (used in less than 50% of the facilities)	Guidance is in use in 50%–65% of the facilities within the country	Guidance is available and being implemented at most (65%–85%) system levels
Low awareness of BAT and BEP. Out-of-date, inefficient, non-environmentally friendly technologies for treatment and disposal	Awareness of the recommended BAT and BEP options but still using out-of-date equipment and technology	Some BAT equipment available at 50% of facilities (or 50% accessing services) and/or at least 50% of the waste being generated is treated and disposed using globally accepted technologies	Globally accepted equipment is widely (more than 51%) available; most facilities are clustered and mapped to an acceptable treatment technology

## Strategic Assessment of the HCWM System

### Using the Maturity Model to Determine First Steps of Investment

# Common barriers and challenges to Healthcare Waste Management (HCWM).



- » Constrained financial resources
- » Complicated change management with new equipment, practices and technology
- » Limited awareness or knowledge on best practices and HCW risk
- » Obsolete technologies, equipment or practices
- » Supportive supervision lacking HCWM
- » Sharps management during campaigns
- » Missing links to a systemic approach across all sectors for HCWM



# People, Processes and Technology are the three main areas in HCWM

HCWM must be considered from a systems perspective and use a broad approach to leverage resources, technologies, and capacity across ministries and government entities involved in WM.



Identify your **PEOPLE** (and expected core competencies of cadre of staff) and human resources needed to train staff and build awareness of the importance of HCWM; increase adherence to and understanding of policies and guidelines; and show commitment to high-quality HCWM.



Identify what **PROCESSES** need to be revised or updated, such as national policies, budget, guidance; map out the flow of HCW between clusters of facilities and to treatment and disposal sites; assess the effectiveness of supervision.



Identify the **TECHNOLOGIES** that are available currently for the steps of HCWM, including segregation, potential links to private-sector resources; and clarify the priorities for the HCWM system overall.

# Six sub areas to assess the maturity level of the HCWM system

## PEOPLE



1. Awareness, training and supportive supervision
2. Adherence and compliance

## PROCESSES



1. National policy/strategic plans
2. Budget and planning
3. Practical guidance

## TECHNOLOGY



6. Technology and equipment availability and use

# Identifying high level gaps and potential opportunities

A tool with questions to facilitate stakeholder engagement in planning for HCWM

Review recent assessments training records, audit and supervision reports

Estimating waste quantities across all health areas

High level update of inventory of treatment and disposal equipment

Landscape private sector companies involved in WM

Financial resources and opportunities for investment

Prioritize most immediate needs of people, processes and technology and identifies long-term strategic planning needs



Builds on the maturity model and system ranking

# ....and the Assessment Tool to rank your HCWM system

- Participatory process with key stakeholders involved in HCWM (broader than immunization)
- Guided by assessments, reports and understanding of context

	AREA	LEVEL RANKING (Level 1–5, lowest to highest)
PEOPLE	Awareness, training and supportive supervision	
	Adherence and compliance	
PROCESSES	National policy/ strategic plans	
	Budget and planning	
	Practical guidance	
TECHNOLOGY	Technology and equipment availability and use	
	<b>TOTAL</b>	
	Divide by 6 (number of areas)	/6
	<b>OVERALL SCORE</b>	



# Results of HCWM Maturity Assessment Findings in 25 countries

# Summary of HCWM Maturity Assessment Findings in 25 countries

Country	People		Processes			Technology
	Awareness, training and supportive supervision	Adherence and compliance	National policy/ strategic plans	Budget and planning	Practical guidance	Technology and equipment availability and use
Benin	2	1	1	1	2	2
Botswana	3	3	2	2	3	3
Burkina Faso	2	3	3	1	3	3
Cameroon	3	4	2	3	3	4
Central African Republic	2	2	2	2	2	1
Comoros	2	2	4	2	1	3
Côte d'Ivoire	3	3	3	2	2	3
Democratic Republic of the Congo	2	2	2	2	3	2
Eswatini	3	3	2	2	3	2
Ethiopia	2	2	3	1	2	2
Gambia	3	2	1	1	1	3
Ghana	2	2	3	1	3	2
Liberia	2	1	1	2	2	2
Malawi	2	2	2	2	1	3
Mauritania	4	3	5	5		3
Mozambique	3	3	4	3	3	2
Namibia	2	3	2	2	3	2
Niger	2	2	1	1	1	2
Nigeria	2	2	1	1	2	2
Senegal	2	2	4	5	5	3
Seychelles	4	4	4	4	4	4
Sierra Leone	3	2	1	1	3	2
South Sudan	3	3	3	2	4	2
Togo	4	4	4	4	4	3
Uganda	3	3	3	3	4	3
AVERAGE	2,60	2,52	2,52	2,20	2,67	2,52

- Major gaps were across the categories of;
  - People,
  - Processes
  - Technology.
- Practical guidance is highest and budgeting planning is lowest.
- This shows that probably there's a lot of guidance and has not been put into practice as seen in the results, this could be because of low budget allocation and planning associated to this.

4

## Recommended steps for Designing and Implementing the HCWM System



# Recommended steps for designing and implementing HCWM system

Conduct a high-level strategic assessment (maturity model)

In proposals e.g. FPP/CDS/HSS, to Gavi and other investors, plan for immediate actions to address common barriers i.e., design and plan system (UNICEF tool), reinforce knowledge and best practices, conduct inventory of existing technologies  
Illustrative indicators are provided

Identify and engage key stakeholders (broader than immunization)

Consider the preferred technology and equipment

Identify opportunities for other forms of investment and collaboration across sectors



# FUNDING OPPORTUNITIES

Agency	Support Area
<b>GAVI</b>	Funding of HCWM (FPP/EAF/COVID-19 Vaccine delivery support) and Coordination of key HCWM partners
<b>UNICEF</b>	HCWM Situation Analysis & Assessment
	Technical Assistance in partnership with GAVI
<b>Africa-CDC</b>	Funding on HCWM through Saving Lives and Livelihoods Programme
	Coordination of key HCWM partners
<b>WHO</b>	Training on HCWM guidance
	Funding of HCWM through C-19 Integration and Health System Strengthening (Canadian Grant)
<b>Global Fund</b>	Funding of HCWM through core allocations (rolling basis)
	Funding of HCWM through new C19RM applications

# Thank you

## 02. Featured Manufacturers: Operations & Maintenance, Capacity Building, Training, and Decommissioning (w/ Q&A)

- Bertin
- Ecosteryl
- Newster
- Tesalys



**STERILWAVE**

**INNOVATIVE SOLUTION  
FOR MEDICAL WASTE MANAGEMENT**

**KEY OPERATIONS AND MAINTENANCE ACTIVITIES**



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## **1) Operations & Maintenance Overview for Sterilwave**

1. Introduction to Standard Operating Procedures (SOPs)
2. Key Maintenance Requirements for Longevity

## **2) Capacity Building & Training Strategy Upon Installation**

1. Training Update Recommendations for Optimal Performance
2. Diverse Training Modules: Tailoring to Different Recipient Needs
3. Identifying Key Recipients for Effective Training Deployment

## **3) Guidance on Equipment Decommissioning**

1. Best Practices for Decommissioning at End-of-Life

# AN EFFICIENT COMPACT ON-SITE SOLUTION FOR HEALTHCARE WASTE TREATMENT



**STERILWAVE SW100**

Up to 20 kg / hour

**STERILWAVE SW250**

Up to 50 kg / hour

**STERILWAVE SW440**

Up to 88 kg / hour

# OPERATIONS & MAINTENANCE OVERVIEW FOR STERILWAVE

## Introduction to Standard Operating Procedures (SOPs)

- **Pre-installation meeting:** access to Bertin engineering consultation
  - ✓ **Installation layout & infrastructure checklist**
  - ✓ **Technical documentation** Installation + user manual / maintenance and cleaning procedure
  - ✓ Access to a set of **video tutorials** procedure
- **Installation of the Sterilwave waste treatment system:**
  - ✓ **Cold Commissioning:** unpacking / inspections / mechanical & electrical connections
  - ✓ **Hot Commissioning:** Performing of first cycles & calibration. Completion of a biological testing cycle to validate the machine sterilization performance (according to WHO recommendations)

### Rapid Installation: Plug and Play

- **Efficient & inclusive Training:** led by Bertin Technologies in English or by local certified team in the native language. Up to 10 trainee per session



Day 1

Cold comissioning

Day 2

Hot comissioning

Day 3 + Day 4

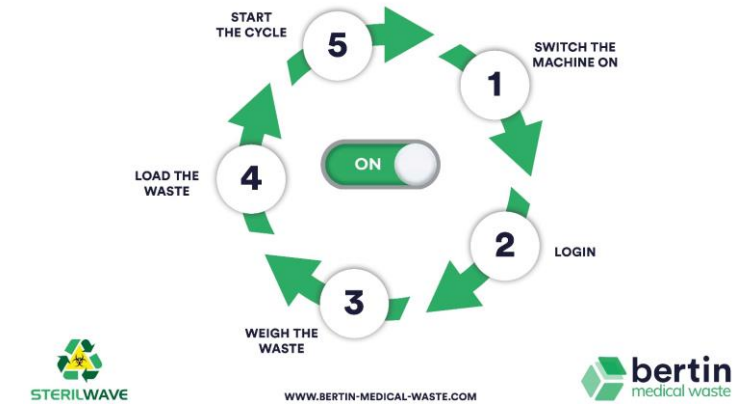
Operatar training

# OPERATIONS & MAINTENANCE OVERVIEW FOR STERILWAVE

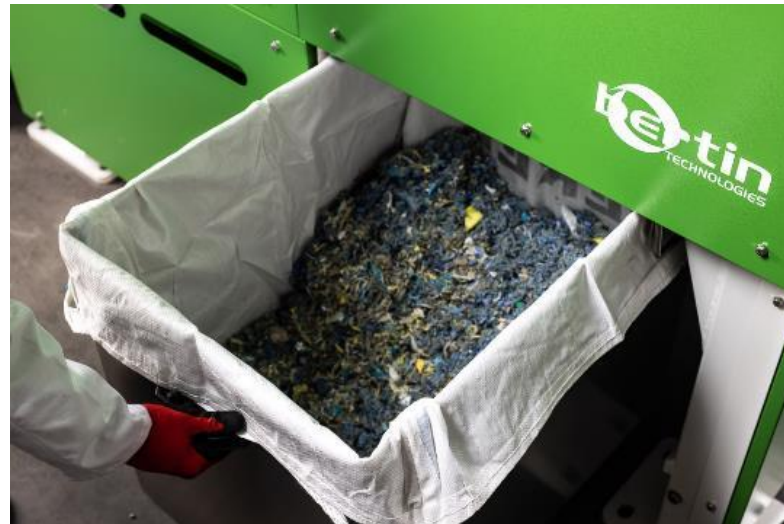
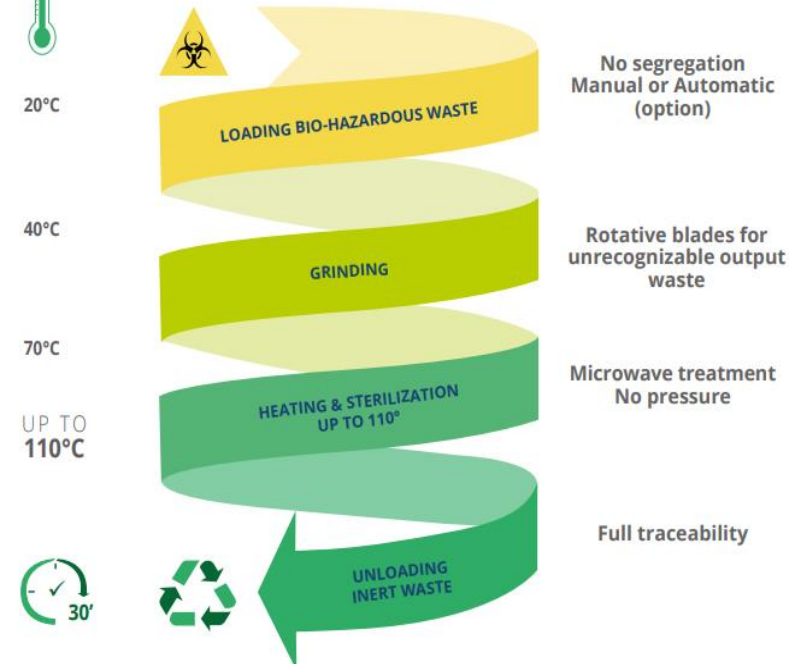
## Introduction to Standard Operating Procedures (SOPs)

- ❖ Non –skilled operator (no need of technical staff)
  - Individuals with disabilities operate Sterilwave in several countries = **promoting CSR**
- ❖ 30 minutes full automatic cycle
- ❖ Less than 10 min operator working time per cycle
  - weighting/loading/unloading

### THE BASIC STEPS TO START A CYCLE



### From infectious waste to municipal waste





# OPERATIONS & MAINTENANCE OVERVIEW FOR STERILWAVE

## - Key Maintenance Requirements for Longevity

Requirements	Description
<b>Daily Routine Inspections</b>	Daily visual checks of major components + machine cleaning (shredder / microwave window / evacuation door) Facility cleaning
<b>Preventive Maintenance Plan</b>	Adherence to servicing schedules of the consumable life span Detailed schedule and spare list are provided and part of the training session with writing & video tutorials
<b>Corrective Maintenance Procedure</b>	Each alarm has a number code link to a specific protocol and guidance. Hotline assistance available 7 days / week Stock of essential spare parts available on-shelf at Bertin local partner warehouse.
<b>Staff Training and Awareness</b>	Continuous operator training on proper procedures Operation by trained operator only (certificate delivered)
<b>Register your machine on Bertin Technical Center for Performance Data Analysis</b>	All cycles data recorded (Secured Cloud / SD Card) Improve strategic preventive maintenance planning and machine care

The screenshot shows a user interface for managing Sterilwave products. At the top, there are navigation links for 'Home', 'My Account', and 'My Products'. Below this is a 'User information' section. The main area is titled 'MY REGISTERED PRODUCTS' and features a form to 'Add a new product' with fields for 'Installation Date\*', 'Product range\*', 'Model\*', 'Serial number\*', 'Country\*', and 'City'. To the right, there is a product card for 'Sterilwave 250' with a serial number of 235, an installation date of 01/29/2024, and a warranty PDF. Below the product card, there are links to download a PDF brochure and contact the support team.

**WHAT KIND OF WASTE CAN BE TREATED?**

THE FOLLOWING PRODUCTS (NON-EXHAUSTIVE LIST) CAN BE PROCESSED BY STERILWAVE EQUIPMENT:

- Soiled syringes, used needles
- Gratuated, volumetric or transfer pipettes
- Sampling needles (steel and silicone cannula)
- Test tubes
- Gloves
- Diapers
- Textiles waste
- Catheter
- Funnels
- Decanting bulb
- Wash bottles
- Single use beaker
- Test tubes
- Vials
- Microplates
- PETRI Dishes
- Microtubes
- Various plastic boxes
- Racks

The infographic also includes the Sterilwave logo and the website address: WWW.BERTIN-MEDICAL-WASTE.COM.

# OPERATIONS & MAINTENANCE OVERVIEW FOR STERILWAVE

## - Key Maintenance Requirements for Longevity - Example

### Preventive maintenance:

- Daily cleaning & visual checking
- Proper waste stream
- Follow-up of preventive plan

### Safety and Regulatory Compliance:

- Periodical bacteriological testing

### Online registration and Performance Analysis:

- Safety cloud / data analysis
- Online platform for strategic planning

### Staff Training and Awareness:

- Continuous operator training

bertin medical waste HOME DEVICES USER LIST DISTRIBUTOR

DEVICE LIST

Want to try extended version ? Click here !

Serial Number  
From  
To  
Distributor  
Customer  
Device type  
Connection status

Status	Serial	Connection	RTM Status	Type	Total Cycles	Total KG	Distributor / Customer	Equipment configuration
📍	1001	02/06/2022	●	SW 100	N/A	N/A	MEDICOM	🔍 🗑️
📍	1002	27/03/2023	●	SW 100	N/A	N/A	MEDICOM	🔍 🗑️
📍	1003	08/02/2024	●	SW 100	N/A	N/A	MEDICOM	🔍 🗑️
📍	1004	23/10/2021	●	SW 100	N/A	N/A	MEDICOM	🔍 🗑️

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# CAPACITY TRAINING STRATEGY UPON INSTALLATION

## - Training Update Recommendations for Optimal Performance for local partners

### Bi-annual online workshop:

- ◆ Training on new machinery & software updates
- ◆ Operational best practices, troubleshooting, and maintenance procedures

### Advanced training at Bertin factory in France:

- ◆ Detailed mechanics and operation of each product line
- ◆ Step-by-step troubleshooting guides with complete procedure
- ◆ Advanced diagnostics and technical support skills
- ◆ Hands-on sessions on machinery operation, maintenance, and troubleshooting
- ◆ Configuration techniques for optimizing performance based on various operational environments

### A worldwide technical support covering all time zones 7 days / week

- ◆ Headquarters and manufacturing facilities in France (Paris & Dieppe) covering Europe, Middle East and Africa
- ◆ Singapore Regional Office covering our Asian Pacific operations
- ◆ USA Regional office covering our Americas operations(North/Central/South)

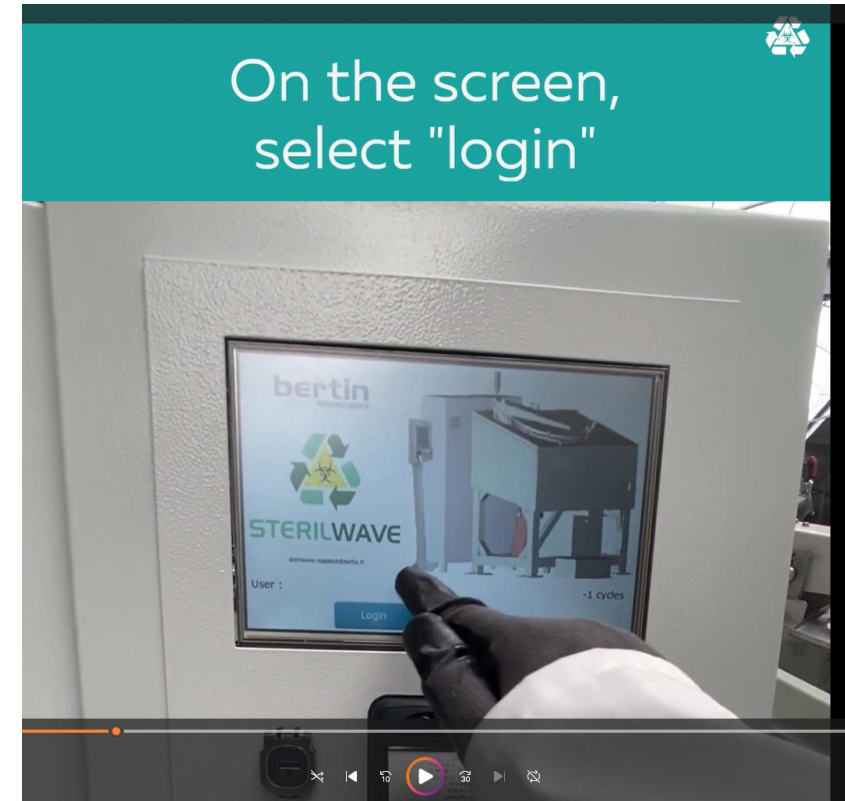
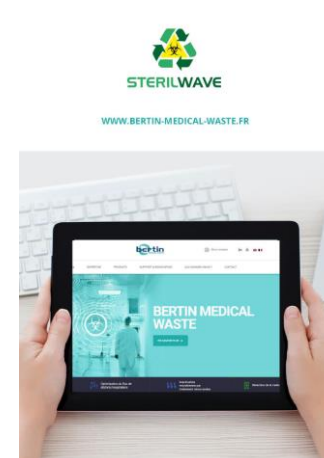
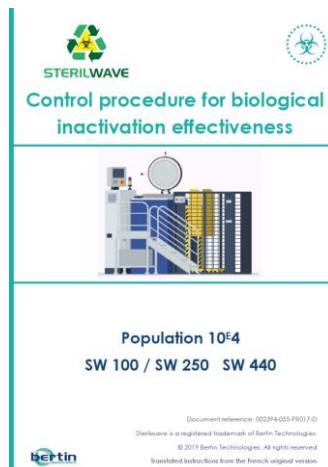
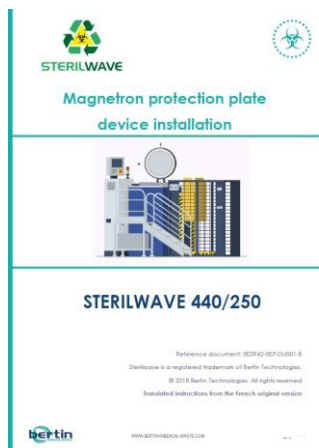


# CAPACITY BUILDING & TRAINING STRATEGY UPON INSTALLATION

## - Diverse Training Modules: Tailoring to Different Recipient Needs

Resource videos and documents on Bertin Medical Waste platform:

- ❖ Cleaning training & protocols
- ❖ Preventive maintenance schedule
- ❖ Curative maintenance diagnostic & Procedures
- ❖ Automation tools & software updates
- ❖ User & maintenance manuals
- ❖ Video tutorials



# CAPACITY BUILDING & TRAINING STRATEGY UPON INSTALLATION

## - Identifying Key Recipients for Effective Training Deployment

### A worldwide network of certified local partner

- ❖ **In each country where Bertin has reference = presence of a trained local partner**
- ❖ Service team in charge of Sterilwave in the country
  - Received **advanced training** from Bertin technical team
  - **Training certificate** issued after the training
  - Stock of all essential **spare parts available** in the country



### Hospitals / Clinics / Laboratories / Healthcare centers:

- ❖ **Bio-engineering, technical & infection control team**
  - Received **training from local partner's** engineering team
  - **Operators do not need to have a technical certification** to work on Sterilwave (some other technologies need proper training/certificate of equipment operating under pressure)
  - Individuals with disabilities operate Sterilwave in several countries = **promoting CSR**
  - **Non-skilled operator can run the Sterilwave system**



# GUIDANCE ON EQUIPMENT DECOMMISSIONING



The Sterilwave machinery is composed of **Zero hazardous material !**

- ❖ **Mechanical parts** are made of Stainless Steel / Galvanized Steel / Painted Steel
- ❖ **Zero hazardous effluent** to treat (no hazardous oils / no hazardous liquid)
- ❖ **E-Waste / Waste Electrical and Electronic Equipment**
  - Engine / inverter / sensors / electrical cabinet component / magnetron & microwave parts
  - → **+99 %** of the electrical and electronic component of the Sterilwave are tagged with the **Recycling Symbol (Mobius strip)**
    - Only 2 capacitors (non-hazardous) are not tagged
- ❖ **No specific handling procedure to decommission** the Sterilwave
  - **No specific protection** - only basic PPE such as safety shoes / gloves / helmet)



Sterilwave SW440 serial n°1 in  
Algeria (2012)

- ❖ Still running up today +60 000 cycles
- ❖ Continuous operation & maintenance

**Stakeholder Communication:** Keep all relevant parties informed throughout the decommissioning process.



# CONTINUOUS ONLINE SUPPORT FOR STERILWAVE ENSURING RELIABLE OPERATIONAL EXCELLENCE

## Bertin Technologies Engineering Team - Expertise and innovation at your service:

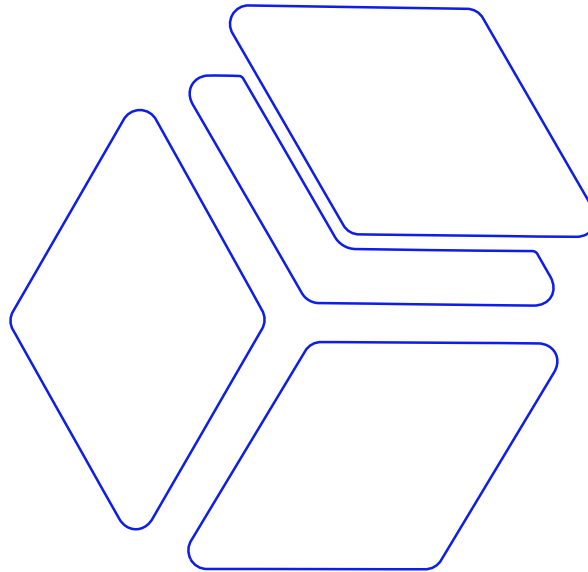
- ◆ French industrial corporation **created in 1956**.
- ◆ Long Industrial experience dealing with **multi-million Euros complex projects**
- ◆ **+650 staff including +300 engineers & technicians**
- ◆ **Global technical support** coverage with dedicated team **across all time zones with 7 days/week support services**
- ◆ **Stock of essential spare parts and consumables in every country** where Sterilwave is installed
- ◆ **Rapid global delivery** ensuring timely shipment of spare parts and consumables. All items (consumables & spares parts) are **available on shelf**

## Enhancing service reach - Local partners team presence:

- ◆ **+85 distributors** in Africa, Americas, Asia, Europe, Middle-East & Oceania
- ◆ Local partners duly **trained & certified** by Bertin Technologies
- ◆ Covering a **+800 installations ballpark worldwide**

## Effortless Maintenance - Easy Replacement Process:

- ◆ **Modular Design:** Quick component interchangeability
- ◆ **Guided Maintenance:** Easy-to-follow manuals and videos
- ◆ **Easy Maintenance:** Minimizes need for specialized tools
- ◆ **Remote Diagnostics:** Enables efficient problem identification
- ◆ **Quick-Release Mechanisms:** Speeds up disassembly and reassembly
- ◆ **Support & Training:** Access to 24/7 assistance and training



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Environmental Solutions  
Since 1947

# Advanced Environmental Solutions for Healthcare Waste Management



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[www.ecosteryl.com](http://www.ecosteryl.com)



# Operations

Ecosteryl offers a fully automatic process:

1. Place the bin on the scale
2. Click on the loading button

You can now focus on  
your other tasks 😊



# Operation of an Ecosteryl 250

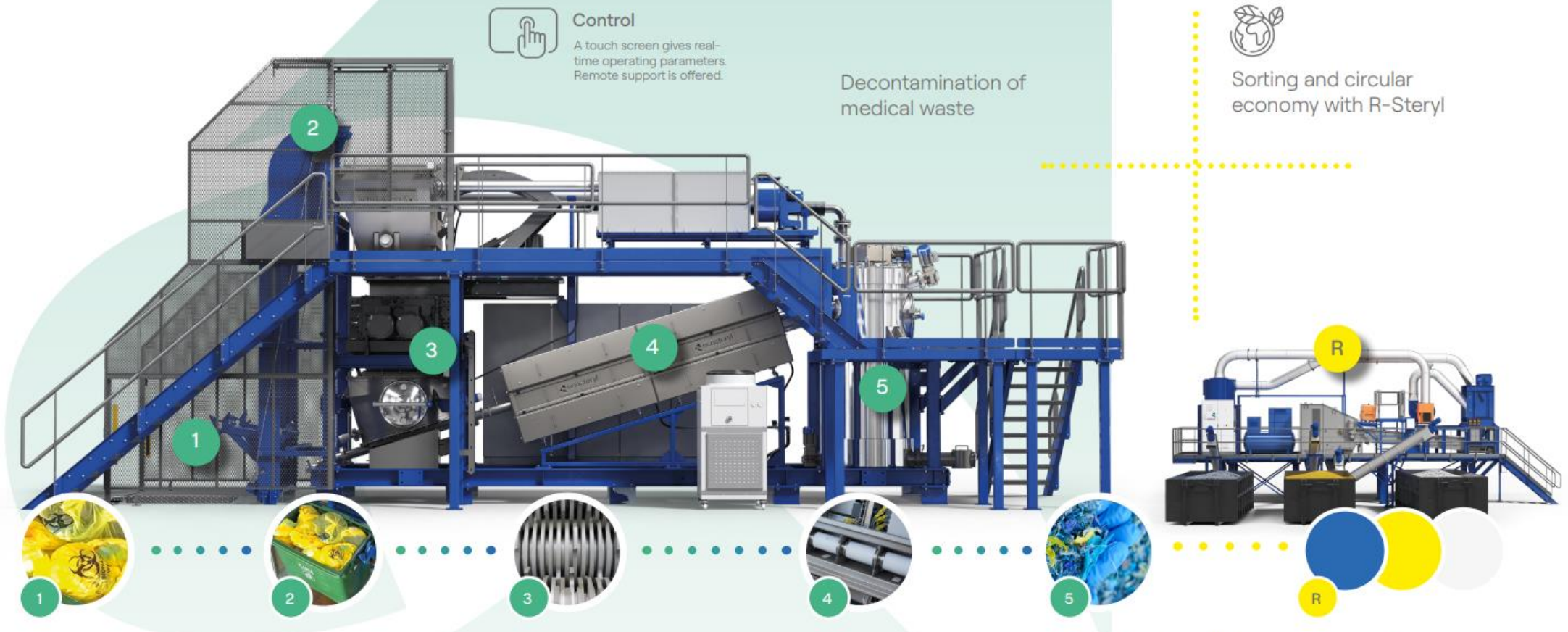


# Operation of an Ecosteryl 75 : manual loading

[Safe Treatment of Medical Waste in Gaza - YouTube](#)



# The process



**Control**  
A touch screen gives real-time operating parameters. Remote support is offered.

Decontamination of medical waste

  
Sorting and circular economy with R-Steryl



**1 Weighing**  
A waste container (wheelie bin) is placed on the machine automated loading system. An industrial scale records the loaded waste weight.  
(applies to models 125 and 250).



**2 Loading**  
Loading is automated: as soon as the loading hopper is empty, a new container is loaded.  
(applies to models 125 and 250).



**3 Shredding**  
A powerful, reliable and slow industrial shredder reduces the medical waste volume up to 80%. The 4 axes and a specially developed screen by Ecosteryl ensure a calibrated shredding.  
Several systems ensure optimal operation of the shredder, preventing any damage to its cutting mechanism (via an anti-blocking system).



**4 Microwave preheating**  
In less than three minutes, the waste will reach a temperature of around 100°C at the microwave tunnel end.  
An automated control system guarantees the quality of the preheating.



**5 Temperature upholding and exit**  
The heated waste is kept for one hour in the tank at a temperature of around 100°C. The combination of these two parameters (time and temperature) ensures full decontamination.  
The waste which exits the machine is decontaminated, dry and unrecognizable. It can directly join the traditional household waste collection route or be sent to the R-steryl sorting center.



**R Sorting of decontaminated waste**  
Decontaminated waste is fed to the R-steryl sorting center. It will be sorted by size and color, according to the customer defined parameters.



## Maintenance: Time required



Ecosteryl users are mainly service providers who operate 24/7 and cannot afford downtime.

**=> Comprehensive preventive and reactive maintenance training.**

- Operation in 1 or 2 shifts => a daily maintenance of **15 to 30 minutes** is recommended.
- 24/7 continuous operation => maintenance of **3 hours per week**.

# Maintenance tasks

## Preventive maintenance :

- Control of the machine's safety devices
- Internal and external cleaning of the unit
- Control of oil levels
- Emptying of gear motors oil
- Post-maintenance verification

## Reactive maintenance :

- Replacement of the microwaves
- Replacement of the shredder blades
- Replacement of sensors
- Post-maintenance verification



## Reactive maintenance example: replacement of the sensors

### Level sensors:

Facilitate real-time monitoring of the tank's capacity beneath the shredder, allowing the activation of the shredder only when needed for no unnecessary consumption. They also ensure timely refilling of the shredder when it becomes empty.

### Temperature sensors:

At the exit of the transfer screw, this sensor ensures that the microwave preheating has been effective. Another sensor measures the temperature of the holding tank and the waste to ensure proper decontamination. A final sensor measures the temperature of the final output.

### Safety sensors:

Present on all access doors.

### Presence sensors:

Ensure safety by protecting the operators and maintenance staff.







## Reactive maintenance example: Shredder blades

Healthcare waste includes sharps such as blades, glass, syringes; and consequently requires robust shredding.

Key component of the machine, [the 4-axis industrial shredder](#) requires attention to its wear in order to plan the replacement of the blades.



Operators are provided with guides, handbooks and SOPs



ecosteryl

# 250

## Maintenance plan

Ecosteryl 250

The **procedure** has been created due to the dangerous nature of non-sterilized wastes. Therefore, it must be followed in order to **avoid contamination risks** for the staff members who handle the machine.

Contact: [aftersales@ecosteryl.com](mailto:aftersales@ecosteryl.com) [www.ecosteryl.com](http://www.ecosteryl.com)

### Maintenance plan

Checklist of tasks (daily, weekly, monthly)  
Safety guidelines

ecosteryl

## Spare parts kit - Ecosteryl 125

Description and typical life span of wearing and maintenance parts.

On a 24-hour continuous working basis and good maintenance.

[www.ecosteryl.com](http://www.ecosteryl.com)

### Spare parts guide

Including parts description, quantities and replacement frequency instructions

ecosteryl

# 250

## Ecosteryl 250

### Machine user manual

Made in Belgium

### User manual

Detailed handbook on operations and maintenance



# Capacity building : training of operators

**Safety Training :** Thorough guidelines for the safe operation of the machine.

Medical control, workplace safety, mandatory medical examinations, vaccinations, tuberculosis checkup, access to the machine. Safety signs, personal protective equipment, safety and emergency protocols.

**Technical training:** machine identification, description, dimensions, power specifications. Listing of all components along with their functionality and interdependence. Commands overview. Operation training. Maintenance training.

**Supervised operation, test and certification of operators**

**Lifetime technical assistance 7/7**





## Capacity building: Training operators for better Quality reporting

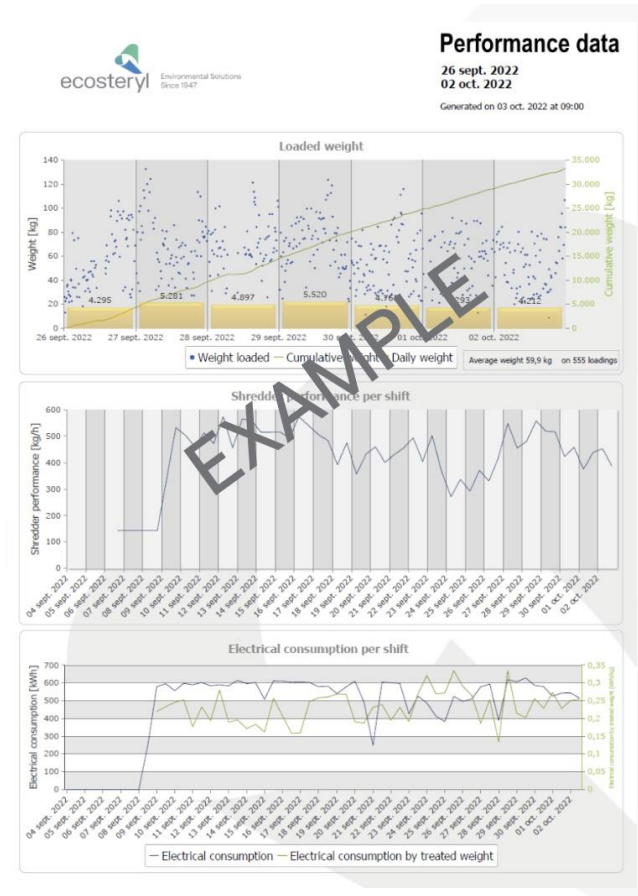
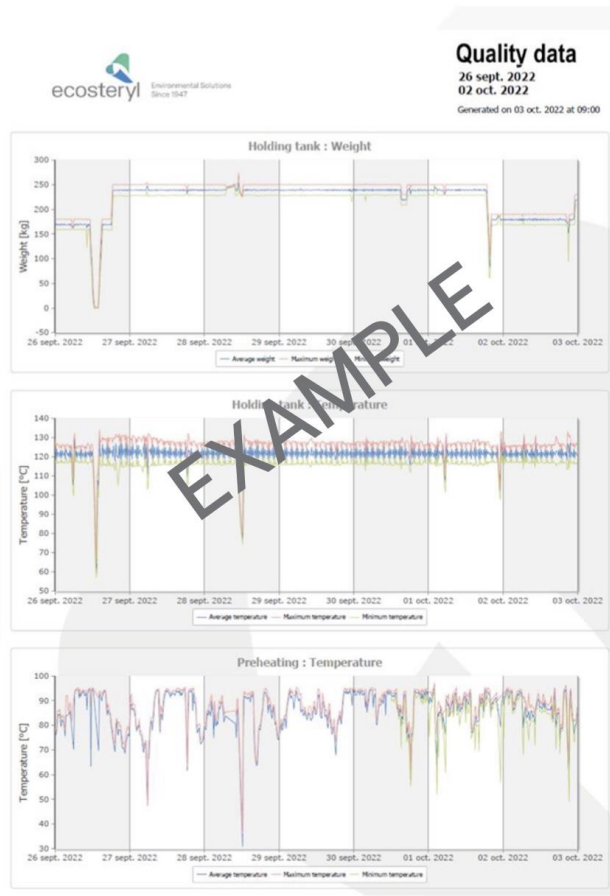
### Why is quality reporting important in our sector ?

- Legal regulations (Ministry of Health, Ministry of Environment, labels, accreditations,...)
- Production overview and preventive maintenance scheduling
- Traceability
- Post-implementation reporting for projects funded through loans and grants

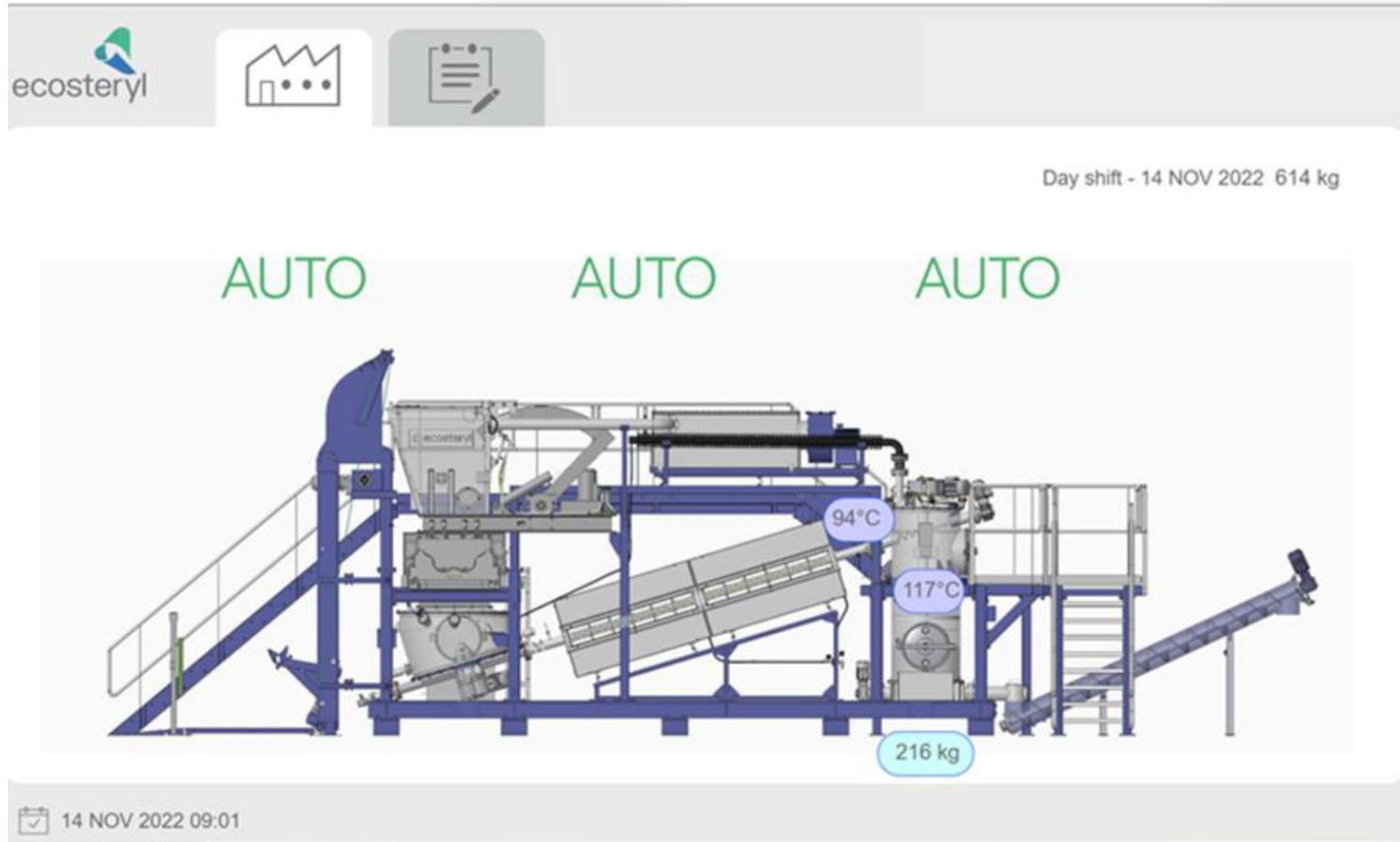
# Online reporting for performance and quality

Ecosteryl offers remote monitoring and automatic reporting solutions.

Remote monitoring allows for checking the machine's status and the KPIs of previous shifts. It is possible to access daily reports providing compiled and processed information on the machine's performance and quality.



# Live monitoring





# Performance data

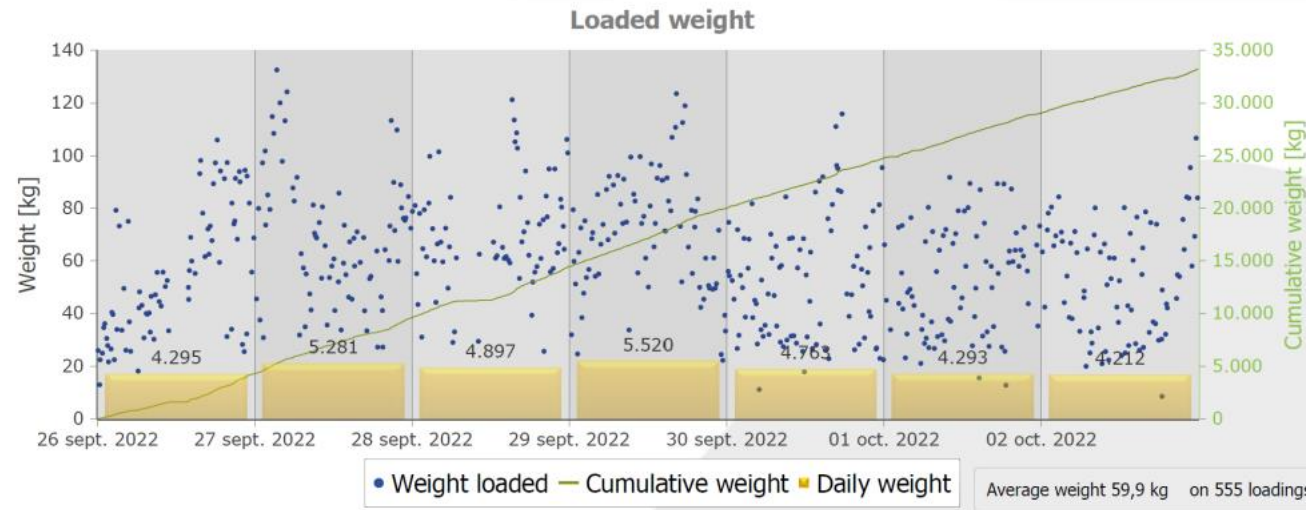
used by the production team

ex. loaded weight and machine productivity per shift

- Accurate loading weight
- Daily total weight
- Cumulative total weight
- Average weight per loading
- Number of loadings

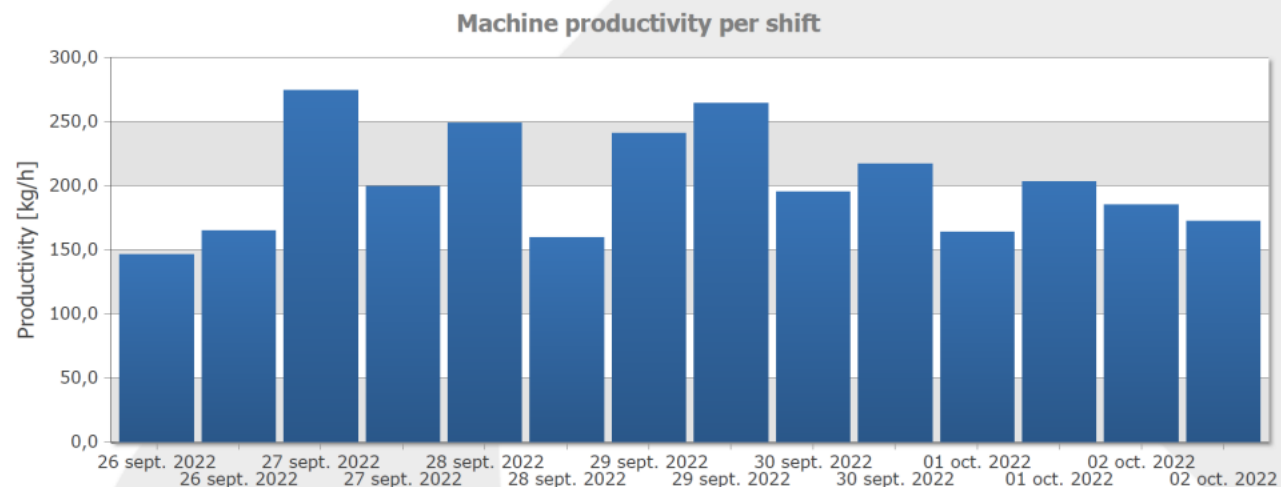
Analyzed info:

- Prevision of production rhythm



Analyzed info:

- Identification of needed training to improve productivity





# Decommissioning of the machine

**You're good. 😊**

The Ecosteryl solutions are industrial systems designed to ensure a long lifespan.  
There is no planned obsolescence.

On average, our machines offer a minimum lifespan of 20 years – First machine still working  
24/7.





# Decommissioning Guidelines for Ecosteryl Machines

- 1. Shutdown and Disconnect:** Power off the Ecosteryl machine and disconnect it from all power sources to prevent any accidental activation during the decommissioning process.
- 2. Cleaning and Disinfection:** Thoroughly clean and disinfect all surfaces of the machine, paying particular attention to areas prone to contamination. Utilize appropriate cleaning agents and follow Ecosteryl recommendations for effective decontamination.
- 3. Disassembly Procedures:** Follow Ecosteryl instructions for disassembling the Ecosteryl machine. Carefully remove components while ensuring proper labeling for inventory and disposal purposes.
- 4. Hazardous Material Handling:** Dispose of any hazardous materials generated during the decommissioning process in accordance with local regulations. Consider **recycling** options for non-hazardous materials to minimize environmental impact.
- 5. Documentation and Reporting:** Maintain detailed records of the decommissioning process, including dates, procedures, and personnel involved. Report any deviations or issues encountered during the process for future reference and compliance purposes.

# Some references



PHILIPPINES



DOMINICAN REPUBLIC



COLOMBIA



CANADA



MOROCCO



KENYA

# Some references



FRANCE



ITALY



TAHITI



GHANA



SPAIN



ALBANIA

# Some references



MALAYSIA



SENEGAL



MOROCCO



SAUDI ARABIA

# Some references



SOUTH AFRICA



USA



ALGERIA



ROMANIA



TAIWAN



GUATEMALA

# Let's talk about medical waste



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# Newster's Operation and Maintenance Activities

## Training & Capacity Building

Gianluca Magrini MSc - Director of R&D Dept.  
Newster Group  
Ledina Hyseni- Project Manager

# Newster Approach for Customer Care

A fully integrated approach for NW sterilizers maintenance

## Standard Preventive Maintenance

Training online  
Training in presence



## Predictive site specific ordinary Maintenance

Remote assistance WebApp



newster. **NW5**  
15 kg/h



newster. **NW15**  
30 kg/h



newster. **NW30**  
70 kg/h



newster. **NW50**  
100 kg/h



# Standard Preventive Maintenance

## **Certified Training Process:**

Newster guarantees an online and in presence professional training and a continuous updating. For every Newster technical partner is mandatory to attend an initial training in Italy (HCWM, Operator training and Ordinary and Extraordinary Maintenance) and periodic freshening courses. Training is provided for operators, technicians and hospital staff;

## **Training is divided in different Levels:**

### **➤ 1st Level Operators:**

Training of operators focuses on daily correct use of the sterilizer. Daily and monthly preventive maintenance.

### **➤ 2nd Level Technicians:**

Training of specialized technician for the ordinary maintenance. Training course at Newster Headquarters in Italy ( Rimini) Is mandatory; Second level technicians can train operators for the first level.

### **➤ 3rd level high skills Technicians:**

Training for the extraordinary maintenance. . Training course at Newster Headquarters in Italy ( Rimini) Is mandatory; High skilled technicians can train technicians for the second level.

# Newster Approach for Training

## Certified Training Process: Competence Badge



**1st Level**



**2nd Level**



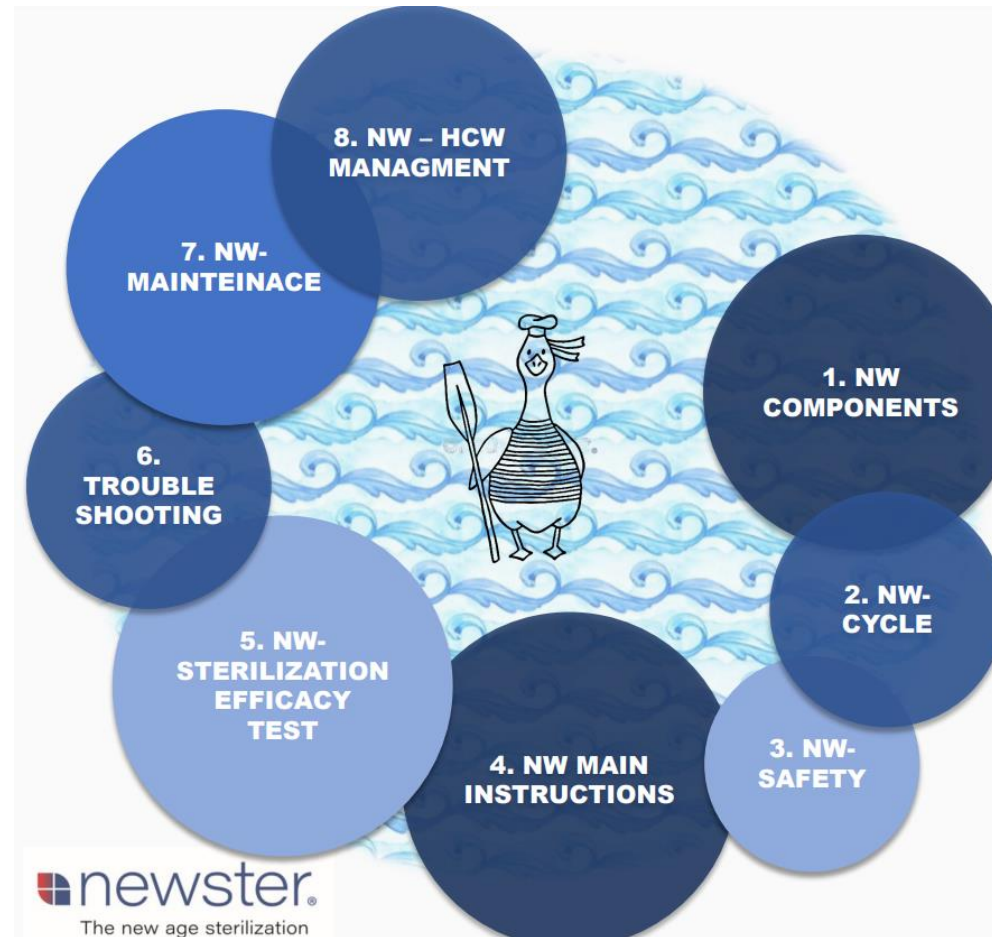
**3rd level**

<b>Knowledge</b>	<b>Skills</b>
<p>Good practices in collection and management of HCW</p> <ul style="list-style-type: none"><li>- Operations of FHT</li><li>- Safety rules</li><li>- Materials that can be treated</li><li>- Procedures for operating the work cycle</li><li>- Validation of the sterilization process</li><li>- Troubleshooting</li><li>- Cleaning and preventive maintenance operation</li></ul>	<ul style="list-style-type: none"><li>• Correct use of PPE;</li><li>• Correct behavior for prevention containment and contrast of the spread of infection;</li><li>• Correct loading and unloading operations, and the relative recordings, with precision and safety</li><li>• Ability to run plant efficiently;</li><li>• Ability to keep the system in good conditions providing maintenance operations.</li><li>• Ability to recognize the main malfunctions and relative possibilities of action;</li></ul>
<p><b>Carry out work effectively and efficiently, in compliance with safety measures to ensure the sterilization of medical waste, and the reduction of associated risk.</b></p>	

# Newster Approach for Training

## Promoting a new healthcare culture

Remote Training programs are provided by the “DOCEBO” e-learning platform combined with the access to the “RESERVED AREA” that provides on-line courses designed for operators .The courses offer a remote training for personnel dedicated to the management of the machines and their maintenance.



# NW –Preventive Maintenance schedule

## Every day

- Discharge the water from the pipe between machine and filter group
- Clean the cell and circular filter on the lid
- Discharge the water of one way valve of air
- Check the central screw of the knives support if is very tight
- Check antiodor level

## Every month

- Spraying system of the cell and demister: dismount the spray nozzles and clean
- Temperature sensor: check the wear if necessary change
- Discharge of Demister: open the demister and clean with acid for hydraulic pipe
- One way valve for introduction of the air in cell: check if there is water inside the valve and if necessary empty
- Circular filter of the lid: clean the filter with compressed air and if necessary change
- Gasket of the lid: check and if necessary change
- Blades: check and if necessary change

## Every 3 months

- Fixed blade: check the wear and in case regulate the position
- Oil of the compressor: check and if necessary fill, and discharge the condense of water from the tank
- External fan: check the fan
- Belt: check and if necessary regulate
- Solenoid valves: if necessary clean
- Vertical blades: check and in case change
- Temperature sensor of external surface of the cell: check
- Check antiodour circuit

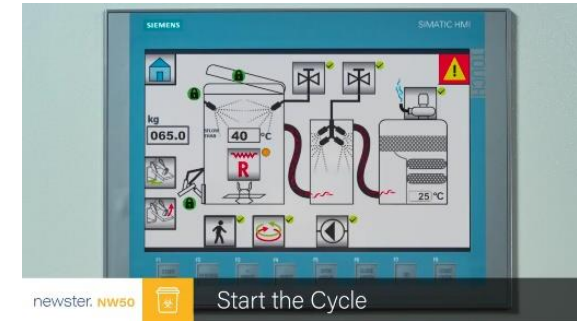
## Every 6 months

- Carbon filter: substitution

## Every year

- Absolute filter: substitution
- Bearings check
- Proof of the machine according to UNI 10384/94 first part

## SOP on Shredding and Sterilization of Infectious waste and Sharps



### Learning Objectives

- ❑ Ensure staff understands how to correctly and safely use the infectious waste shredding and disinfection equipment.

# SOP – First Level Training

## HCWM Manager Training

### PART A: PREPARATION / BEFORE THE SHIFT

1

## Standard Operating Procedure

### SOP– SAFE SHREDDING AND STERILIZATION

2. **CHECK** the access door clearly marked with international biohazard sign and the authorized personnel only sign.

**Only authorized personnel should be allowed in the room. There should be no eating, drinking, and smoking allowed.**



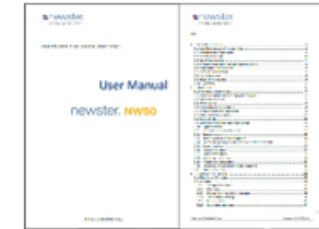
YES NO

## Standard Operating Procedure

### SOP – SAFE SHREDDING AND STERILIZATION

1. **VERIFY** that the operator has read the User Manual for the shredder / sterilization machine. This SOP should be followed in conjunction with the instructions in the User Manual.

**IN PARTICULAR THE USER SHOULD BE AWARE OF THE CRUSH AND BURN RISKS INDICATED IN THE MANUAL.**



2

## Standard Operating Procedure

### SOP– SAFE SHREDDING AND STERILIZATION

3. **CHECK** the floor around the sterilization machine is clean and free from trip or spill risks.

**The floor area around the sterilization machine must be swept and mopped after every treatment batch.**



# SOP – First Level Training

## HCWM Manager Training

### PART B: LOADING THE MACHINE

5

## Standard Operating Procedure

### SOP – SAFE SHREDDING AND STERILIZATION

5. **CHANGE INTO** coveralls and boots. These clothes must be changed at the end of the shift and must not be worn home. Overalls are to be washed and disinfected at least weekly.

A changing room with showers and lockers for clothes is available to staff.



6

## Standard Operating Procedure

### SOP– SAFE SHREDDING AND STERILIZATION

6. **PUT ON** the needlestick gloves, facemask and eye protection. Needlestick gloves must be worn for all procedures involving sharps waste.

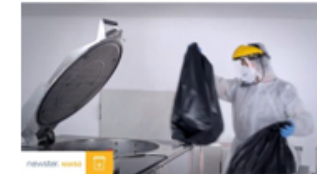


	YES	NO
6. PUT ON the needlestick gloves, facemask and eye protection. Needlestick gloves must be worn for all procedures involving sharps waste.	<input type="checkbox"/>	<input type="checkbox"/>

## Standard Operating Procedure

### SOP – SAFE SHREDDING AND STERILIZATION

7. **CONFIRM** the room ventilation system is turned on before starting the shift. The fan should provide at least 10 room changes of air per hour.



# SOP – First Level Training

## HCWM Manager Training

### PART C: UNLOADING THE WASTE

17

## Standard Operating Procedure

### SOP – SAFE SHREDDING AND STERILIZATION

**26. OPEN** the shredded waste side panel and brush any excess shredded waste into the collection bag.



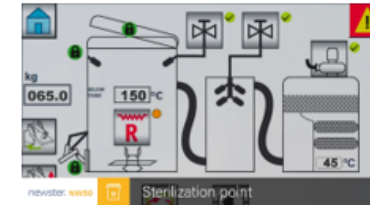
YES

NO

## Standard Operating Procedure

### SOP #16 – SAFE SHREDDING AND STERILIZATION

**22. VERIFY** sterilization has completed, the cooling cycle has ended, and the batch is safe to unload.

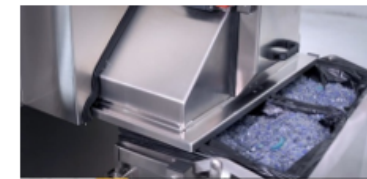


18

## Standard Operating Procedure

### SOP – SAFE SHREDDING AND STERILIZATION

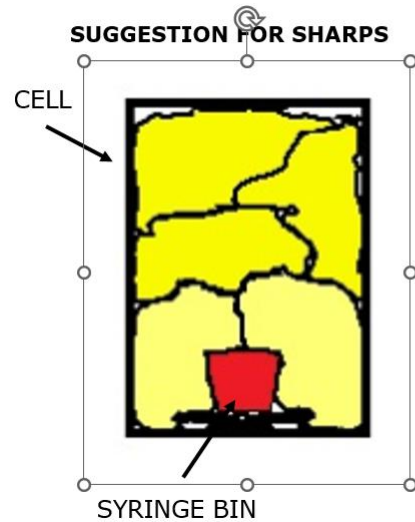
**28. VERIFY** the wastes have been shredded and sterilized as expected.





# Instructional tutorials and videos

## NW – How to load the machine



### Syringe Bin

•When present it should be placed at the bottom of the vessel between two layers of waste.

•It is recommended to place it not in direct contact with the vessel wall.

## NW – User safety: Personal Protective Equipment



Dust mask –FFP2 or FFP3 standard

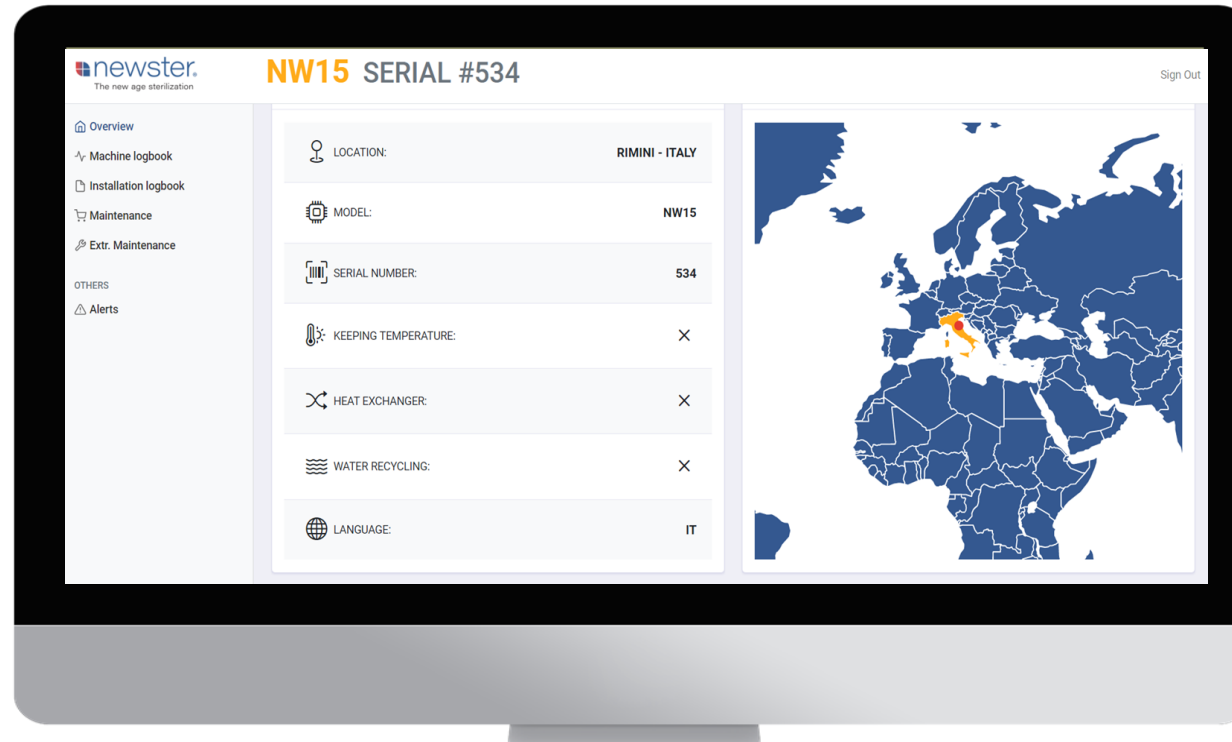
Protective glasses or visor – EN166 and EN170

Waterproof protective clothes – EN13034

Heavy duty gloves for chemical and microorganism protection - EN374.



# Predictive Ordinary Maintenance



The main aim of In-Sight 4.0 is to develop a smart predictive monitoring and maintenance system, focused on remote monitoring and self-diagnosis functions of Newster installations. In-sight 4.0 does not require direct connections to hospital networks, and a simple internet connection is sufficient. Residual life time of consumables can be checked in real time and can be order directly through the web app.

# More Specifically ...

## PREDICTIVE MONITORING AND MAINTENANCE



NW15 #534



**Plants List**

MAIN MENU

- Overview
- Machine logbook
- Installation logbook
- Spare parts**
- Maintenance
- Operators

OTHERS

- Smart panel
- Alerts

### Spare parts

#### BLADES SPARE PARTS

**BLADE CAST IRON (4)** ○○○○○  
MC00596 Residual life 0%

Replaced 141 days ago

#### REPLACEMENT LOGBOOK

Date	Working hours	Cycles
26/09/2023	3760 hrs	7010
28/03/2023	3088 hrs	5987
08/03/2023	2987 hrs	5845

**VERTICAL BLADE 15** ○○○○○  
MF00603 Residual life 0%

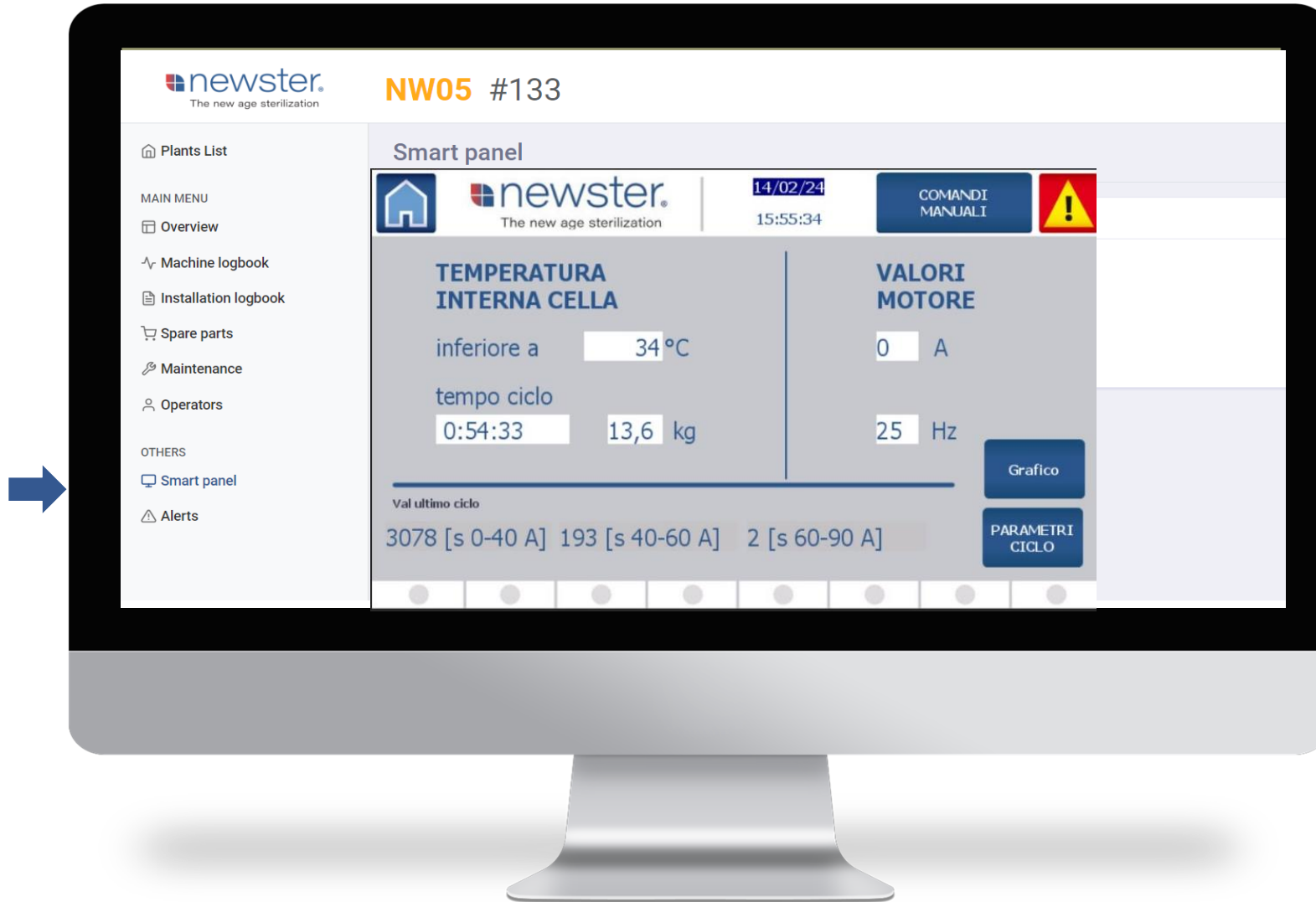
Replaced 119 days ago

**FIXED BLADE TEMPERED (2)** ●○○○○  
MC00601 Residual life 12%

Replaced 880 days ago

#### SHOPPING CART

# REMOTE ASSISTANCE WEBAPP



## Environmental sustainability analysis of Newster Sterilizer NW50

The present analysis was developed in collaboration with Università Politecnica delle Marche (Ancona, Italy), Department of Life and Environmental Sciences.

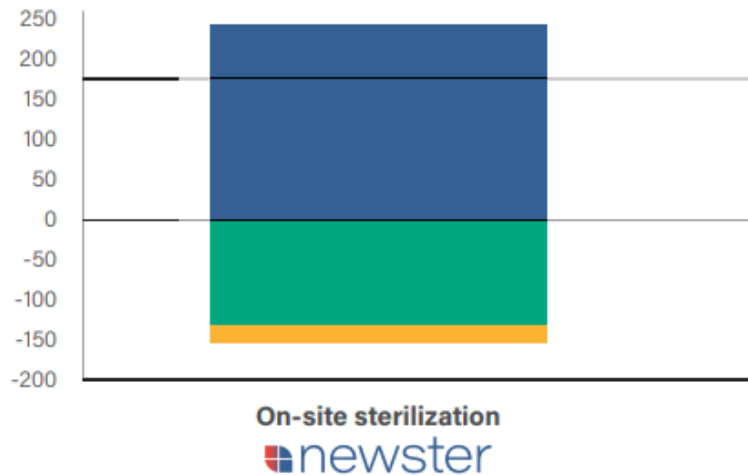
The present analysis aims at the environmental sustainability assessment of two steps of the Newster sterilizer (NW50): the manufacturing and the end-of-life. The NW50 has been chosen for the analysis since it is the bestselling model. Furthermore, considering its characteristics, it is representative of the smaller models NW15 and NW5.



# The Environmental Benefits

## Environmental Footprint [P.E.\*]

concerning the production and end-of-life stage of the sterilizer

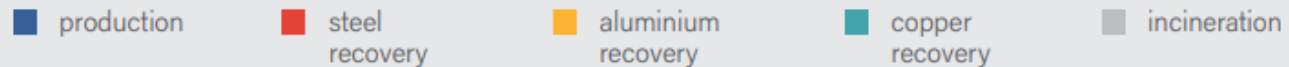


# 60%

### Environmental benefit

The possibility of recycling most of the materials is able to compensate for the environmental impacts associated with the production phase.

\* **Person Equivalent:** number of people having the same impact on one year in Europe.





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**Ledina Hyseni**

[lhyseni@newstergroup.com](mailto:lhyseni@newstergroup.com)

Discover all the links in the pdf: you will find videos presenting the technologies and other useful insights!



“thank you for  
your **ATTENTION**  
:)”

Certified by



HEADQUARTERS AND MANUFACTURING

Newster System S.r.l.

VAT NUMBER IT09269221009

Via Pascoli, 26/28

47853 Cerasolo di Coriano (RN)

Italy

Ph. +39 0541 759160

FAX +39 0541 759163

SALES CONTACT

[market@newstergroup.com](mailto:market@newstergroup.com)

# ON SITE TREATMENT SYSTEMS FOR INFECTIOUS HEALTHCARE WASTE

Session 3 - Facility-level Activities: Managing Health Care  
Waste

---

Benjamin LOBBE | Tesalys Business Development Manager - Asia Pacific



Member of :





# TESALYS STERIPLUS™ & STERISHRED® RANGES

COMPACT EQUIPMENT FOR SMALL / MEDIUM MEDICAL CENTERS UP TO LARGE HOSPITALS

4 MODELS WITH CAPACITIES FROM 4KG/H  
UP TO 100 KG/H



STERIPLUS™ 40  
10T /YEAR



STERIPLUS™ 80  
20T /YEAR



STERISHRED® 250  
70T /YEAR



STERISHRED® 700  
150T /YEAR

## SERVICES



INSTALLATION



QUALIFICATION



MAINTENANCE

## EXAMPLES



# IDEAL FOR SMALL / MEDIUM SIZE HOSPITALS IN REMOTE AREAS

**Remote support from France / Asia Office**  
thanks to our 4G & WiFi  
equiped machines



**On site support** by our  
trained & Tesalys certified  
partners



**Smallest all integrated device** for small & medium size hospitals



**100+** installations  
performed on islands &  
remote areas located far  
from main cities / waste  
treatment hubs

STEMPLUS™

# UTILITY REQUIREMENTS & CONSUMPTION

## WATER, ELECTRICITY, DRAIN

3-phase, 380V, 50/60 Hz

Very low electricity  
consumption

**ELECTRICITY**

Water intake 2,5 bar

90% less water consumption than  
traditional autoclave

**WATER**



Heat resistant (iron cast, cooper, ...)

**DRAIN**

**AS PER INSTALLATION REQUIREMENTS DOCUMENT & CHECK-LIST**

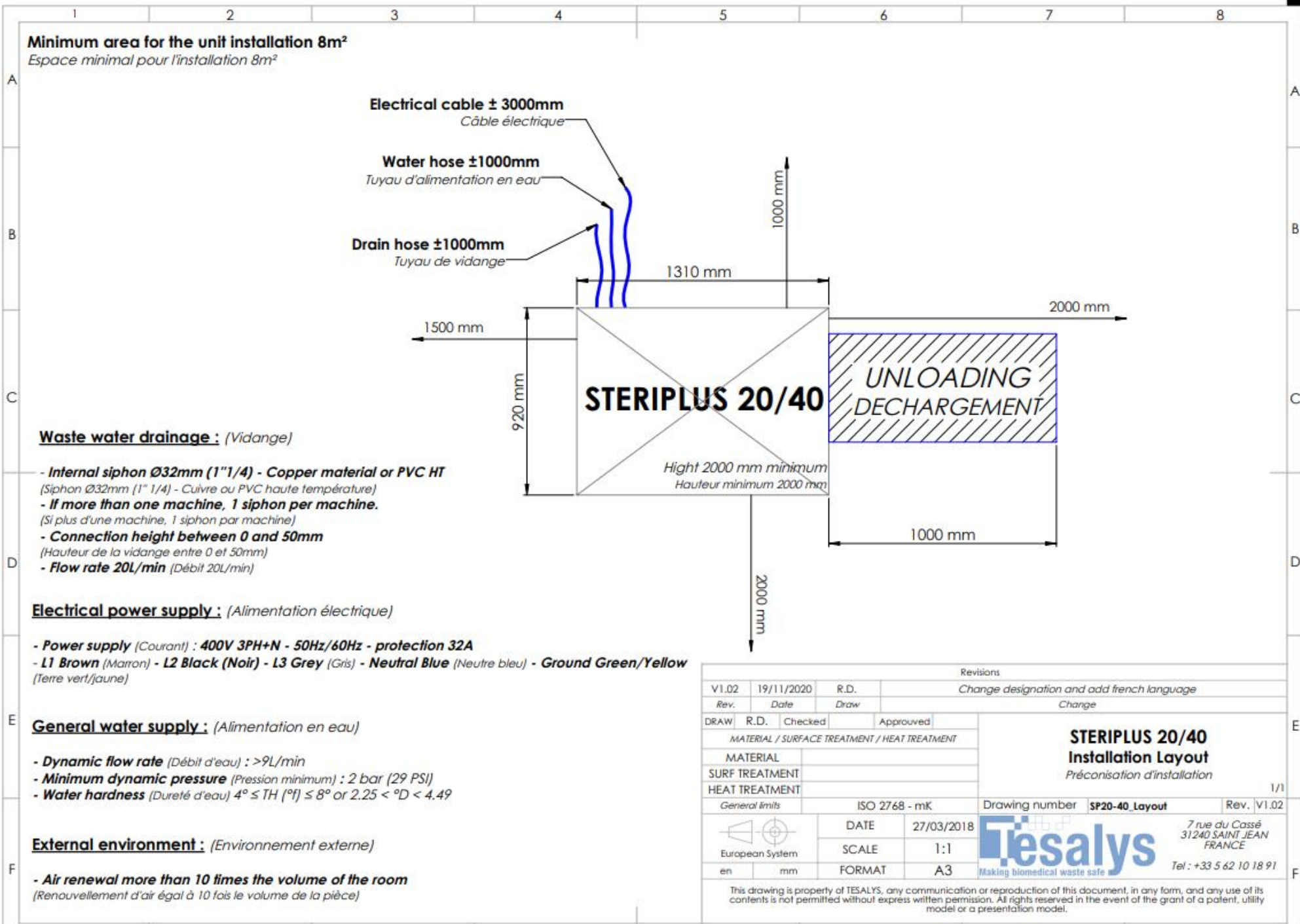
# Different steps after procurement

The Stages followed prior to delivery & final installation



1	SITE PREPARATION	Site prepared by end user in coordination with our local partner & Tesalys Engineer.
2	PRE INSTALLATION CHECKS	Final validation by the local partner & Tesalys.
3	INSTALLATION & CONNEXION TO UTILITIES	Installation done by local partner certified by Tesalys Factory.
4	COMMISSIONING & START UP	Done by local partner or by / with Tesalys Engineer.
5	TECHNICAL TRAINING	Training to end user performed in local language by local partner.

Site preparation:  
Steriplus recommended installation layout documents



**Minimum area for the unit installation 8m<sup>2</sup>**  
Espace minimal pour l'installation 8m<sup>2</sup>

**Electrical cable ± 3000mm**  
Câble électrique

**Water hose ± 1000mm**  
Tuyau d'alimentation en eau

**Drain hose ± 1000mm**  
Tuyau de vidange

**Waste water drainage :** (Vidange)

- **Internal siphon Ø32mm (1"1/4) - Copper material or PVC HT**  
(Siphon Ø32mm (1" 1/4) - Cuivre ou PVC haute température)
- **If more than one machine, 1 siphon per machine.**  
(Si plus d'une machine, 1 siphon par machine)
- **Connection height between 0 and 50mm**  
(Hauteur de la vidange entre 0 et 50mm)
- **Flow rate 20L/min** (Débit 20L/min)

**Electrical power supply :** (Alimentation électrique)

- **Power supply (Courant) : 400V 3PH+N - 50Hz/60Hz - protection 32A**
- **L1 Brown (Marron) - L2 Black (Noir) - L3 Grey (Gris) - Neutral Blue (Neutre bleu) - Ground Green/Yellow (Terre vert/jaune)**

**General water supply :** (Alimentation en eau)

- **Dynamic flow rate (Débit d'eau) : >9L/min**
- **Minimum dynamic pressure (Pression minimum) : 2 bar (29 PSI)**
- **Water hardness (Dureté d'eau) 4° ≤ TH (°f) ≤ 8° or 2.25 < °D < 4.49**

**External environment :** (Environnement externe)

- **Air renewal more than 10 times the volume of the room**  
(Renouvellement d'air égal à 10 fois le volume de la pièce)

Revisions			
V1.02	19/11/2020	R.D.	Change designation and add french language
Rev.	Date	Draw	Change
DRAW	R.D.	Checked	Approved
MATERIAL / SURFACE TREATMENT / HEAT TREATMENT			
<b>STERIPLUS 20/40</b>			
<b>Installation Layout</b>			
Préconisation d'installation			
1/1			
General limits		ISO 2768 - mK	Drawing number <b>SP20-40_Layout</b>
			Rev.   V1.02
European System		DATE	27/03/2018
		SCALE	1:1
en mm		FORMAT	A3
		 7 rue du Cassé 31240 SAINT JEAN FRANCE Tel : +33 5 62 10 18 91	
This drawing is property of TESALYS, any communication or reproduction of this document, in any form, and any use of its contents is not permitted without express written permission. All rights reserved in the event of the grant of a patent, utility model or a presentation model.			

## TRAINING ONTO TESALYS SITE\*

Training process regarding the STERIPLUS™ range (SP20-SP40-SP80).

### Technical training\* (2 days)

Training goals	Technical autonomy on the machines for preventive and the curativeservices
Training deliver to	Technical team
Training resources	Manuel User manual, waste management tips & manual, STERIPLUS™ device
Trainer	STERIPLUS™ specialised after sales technician

### Program

1 <sup>st</sup> assesment : Introduction	Decontamination process
	Waste management
	STERIPLUS™ range and spare parts
2 <sup>nd</sup> assesment: Introducing the system	Opening of the machine
	Localise the parts in the machine
	preventiveservice
3 <sup>rd</sup> assesment: Discover the breakdowns	Analyse the origin
	Fixing actions
4 <sup>th</sup> assesment : Atelier	Assemble
	Disassemble

### End users Training\* (1 Day)

Training goals	Learn the way to use the machine in the best conditions
Training delivered to	End users of STERIPLUS™
Training resources	User manual, waste management tips & manual, STERIPLUS™ device
Trainer	STERIPLUS™ specialised after sales technician

### Program

Decontamination principles	The different steps of the sterilisation process
	Autoclave management
	Type of waste treatable by the device
Waste management	The use of the machine respecting safety rules
	Loading
	Treatment cycle
	Unloading
Machine service	Maintain the device in good condition
	Understand the device signals
Understand the device signals	Study the device signals and alarms
Question/answer	Answering all the questions of the end users

\*travel fees included

End user training:

Sample of training  
program followed in local  
language

End user training:

Do & Don't documents adapted to each facility in local language

## DO ✓

	<b>INFECTIOUS WASTE</b> <ul style="list-style-type: none"> <li>• NONWOVEN FABRICS, SWABS, NAPPIES, DIALYZERS, BLOOD BAGS...</li> <li>• FAECES, URINES, BLOOD, SPUTUM...</li> </ul>
	<b>PATHOLOGICAL &amp; ANATOMICAL</b> <ul style="list-style-type: none"> <li>• ORGANS, TISSUES, SMALL BODY PARTS</li> <li>• PLACENTAS, BIOPSY SAMPLES, SMALL BONES</li> </ul>
	<b>HAZARDOUS CHEMICAL WASTE*</b> <ul style="list-style-type: none"> <li>• GENERATED DURING DISINFECTING &amp; CLEANING PROCESS</li> <li>• NON EXPLOSIVE RESIDUES</li> <li>• SMALL QUANTITIES OF OUTDATED PRODUCTS</li> </ul>
	<b>SHARPS SMALL SIZE</b> <ul style="list-style-type: none"> <li>• NEEDLES</li> <li>• BLADES</li> <li>• SMALL SURGERY INSTRUMENTS (Stainless Steel &lt;8MM THICK)</li> </ul>
	<b>HIGHLY INFECTIOUS WASTE</b> <ul style="list-style-type: none"> <li>• MICROBIAL CULTURE EQUIPMENT, PETRI DISHES</li> <li>• BODY FLUIDS</li> </ul>
	<b>OTHERS</b> <ul style="list-style-type: none"> <li>• SOFT OR RIGID PLASTICS, RUBBER MATERIAL</li> <li>• PAPER, CARDBOARD</li> <li>• GLASS</li> </ul>
	<b>LIQUID INFECTIOUS WASTE</b> <ul style="list-style-type: none"> <li>• LESS THAN 30% OF TOTAL VOLUME OF THE LOADING CHAMBER</li> </ul>

## DON'T ✗

	<b>PATHOLOGICAL &amp; ANATOMICAL WASTE*</b> <ul style="list-style-type: none"> <li>• LARGE BONES &amp; RECOGNISABLE HUMAN BODY PARTS</li> </ul>
	<b>HAZARDOUS PHARMACEUTICAL WASTE</b> <ul style="list-style-type: none"> <li>• EXPIRED, UNUSED SPILT &amp; CONTAMINATED PRODUCT</li> <li>• DRUG, VACCINS</li> <li>• CYTOTOXIC</li> <li>• GENOTOXIC</li> </ul>
	<b>HAZARDOUS CHEMICAL WASTE</b> <ul style="list-style-type: none"> <li>• TOXIC</li> <li>• CORROSIVE</li> <li>• FLAMMABLE</li> </ul>
	<b>WASTE WITH A HIGH CONTENT OF HEAVY METALS</b> <ul style="list-style-type: none"> <li>• CADMIUM OR MERCURY FROM THERMOMETERS, MANOMETER</li> </ul>
	<b>PRESSURIZED CONTAINERS</b> <ul style="list-style-type: none"> <li>• SPRAY CANS</li> </ul>
	<b>LARGE QUANTITIES OF LIQUIDS</b> <ul style="list-style-type: none"> <li>• MORE THAN 30% OF TOTAL VOLUME OF THE LOADING CHAMBER</li> </ul>
	<b>LARGE METALLIC PARTS</b> <ul style="list-style-type: none"> <li>• STAINLESS STEEL PARTS &gt;8MM OF THICKNESS</li> <li>• TITANIUM PROTHESIS</li> <li>• LARGE METALLIC INSTRUMENTS (E.G . FORCEPS)</li> </ul>
	<b>TEXTILE</b> <ul style="list-style-type: none"> <li>• BLOUSE, PANTS, SHOES, SHEET</li> </ul>
	<b>DOMESTIC</b> <ul style="list-style-type: none"> <li>• BOOK, DISC...</li> </ul>
	<b>RADIOACTIVE WASTE</b>

# STERIPLUS™

A user friendly solution

## Daily operations



2

Start button



1

Load



3

Unload



No technical skills needed  
Software in local language & english  
Intuitive system



# Operation video

The diagram illustrates the STERIOPLUS sterilization process through several stages: SHREDDING, PREVACUUM, STEAM INJECTION, STERILIZATION, STEAM EXHAUST, and EFFLUENTS DRAIN. The process is shown in a cutaway view of the machine, which is labeled STERIOPLUS™. The internal components are labeled as follows:

- LOADING CHAMBER
- SHREDDER
- SOLID WASTE (SHREDDED)
- LIQUID WASTE & EFFLUENTS

Key operational parameters and features are highlighted:

- STEAM STERILIZATION AT 135 °C DURING 10 MIN.
- STERILIZATION PARAMETERS ADJUSTABLE ACCORDING TO LOCAL REGULATIONS.

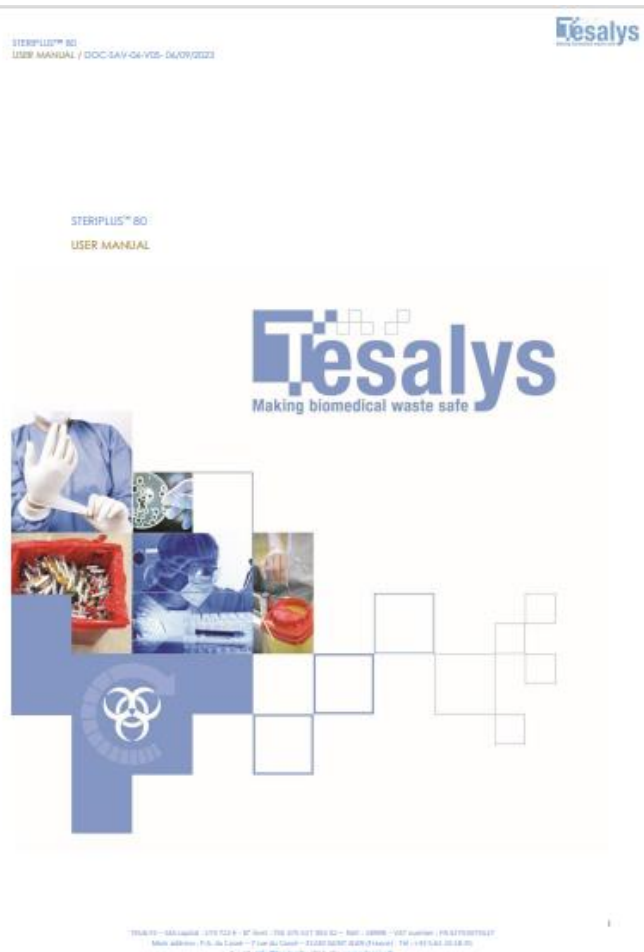
The control panel displays the following information:

- PRESSURE: 3200 mbar
- TEMPERATURE: 135 °C

A circular timer indicates the current duration of the process: 04:29 min.

# Daily operations

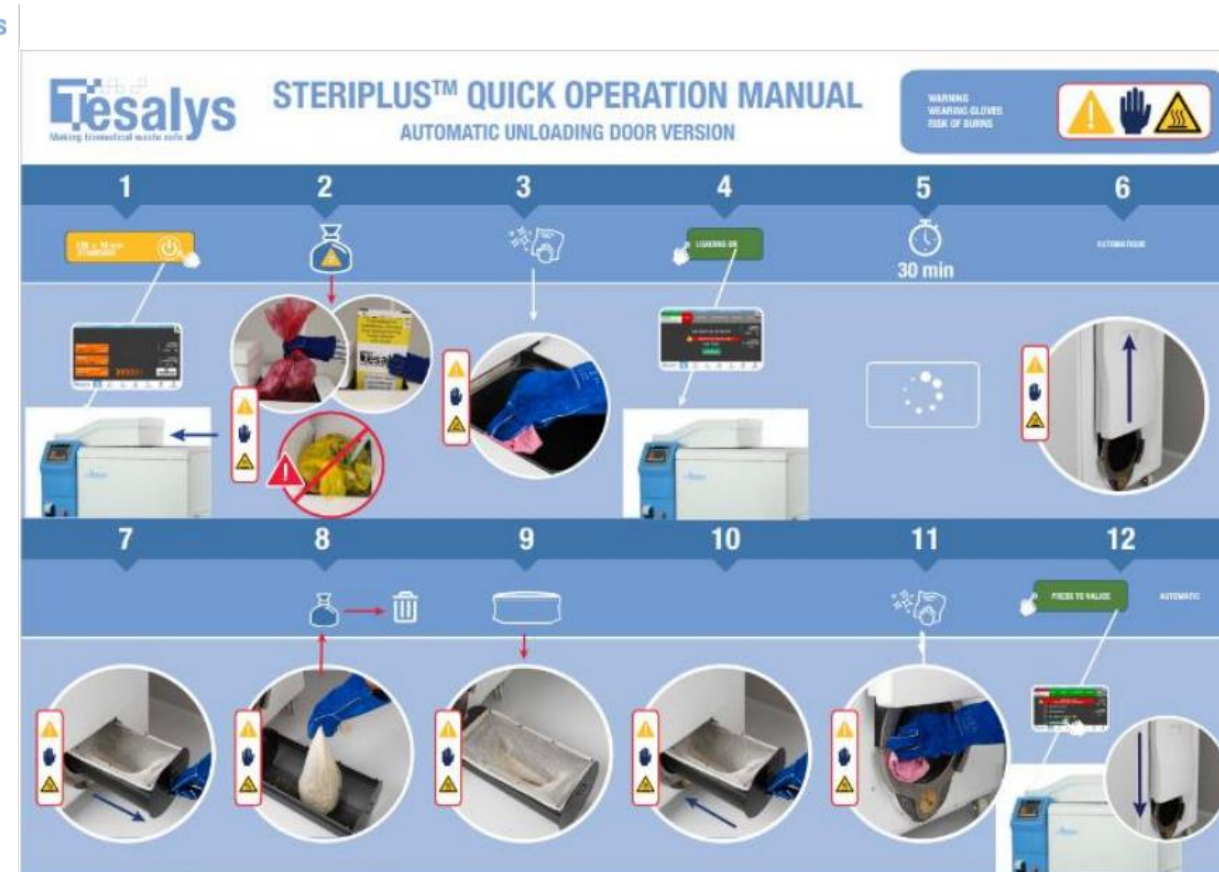
User guides for each machine  
Posters for operation guides



STERIPLUS™ 80  
USER MANUAL / DOC-SAV-04-V05-06/09/2023

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# Daily operations



Identifiant ou adresse e-mail

Mot de passe

Se souvenir de moi

## The extranet

Detailed access to cleaning, maintenance, user guides & manuals on each type of unit:

Video tutorials

Explained photos

Cleaning processes

Contacts numbers & emails of Tesalys & Services Teams

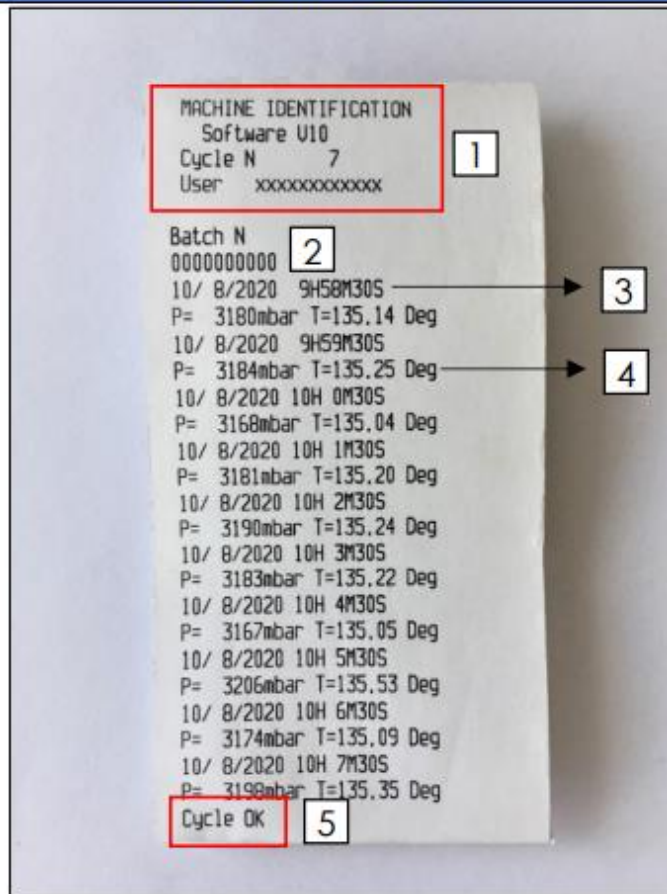
# Routine testing & conformity

The screenshot displays the control interface for a Steriplus machine. At the top, the time is 03:56:47 PM on 08/01/2016. The machine name is STERIPLUS, and the cycle information is CYCLES : 00009 | ID : MACHINE IDENTIFICATION. The cycle is currently in the 'LOADING' phase, indicated by a red arrow pointing right. The cycle stages are: HighRisk T+, Standard, Decont/Heat-Up, LOADING, SHREDDING, DECONTAMINATION, UNLOADING, and END OF CYCLE. A warning icon is present in the top right. The main display area shows 'LOADING DOOR CLOSING IN PROGRESS' with a circular progress indicator. On the right, real-time chamber data is shown: CHAMBL...<sup>0</sup> PRESSURE 997 mbar abs and CHAMBER TEMPERATURE 101.8 °C. The bottom navigation bar includes icons for HOME, TOOLS, STATS, LOGIN, CONFIG, INFO, and MANUAL.

Real time cycle process

Real time chamber data

Instinctive settings for complete independance



## Routine testing & conformity

- Traceability of cycle data on printer ticket or USB
- WiFi / 4G connexion

### 1 Identification of the machine

This part identifies the machine, the software, the cycle number and the user.

### 2 Batch

This part indicates the name of the cycle that can be customized in the INFO part (see INFO touch menu) ex: BATCH TEST COVID

### 3 Date and time

This part indicates the date of the cycle in the form dd/mm/yyyy and the time of data recording in hours minutes and seconds.

### 4 Pressure and temperature

This line shows the pressure (P) and temperature (T) at the date and time indicated on the line above. The data are respectively indicated in millibar (mbar) and degrees (Deg).

### 5 Cycle OK or Cycle NOK

# Troubleshooting & corrective maintenances

## Preventive maintenances programs



1

### DAILY MAINTENANCE

Daily cleaning done by the end user.

2

### MONTHLY MAINTENANCE

Monthly check up & cleaning done by the end user with or by the local partner.

3

### 600 CYCLES MAINTENANCE

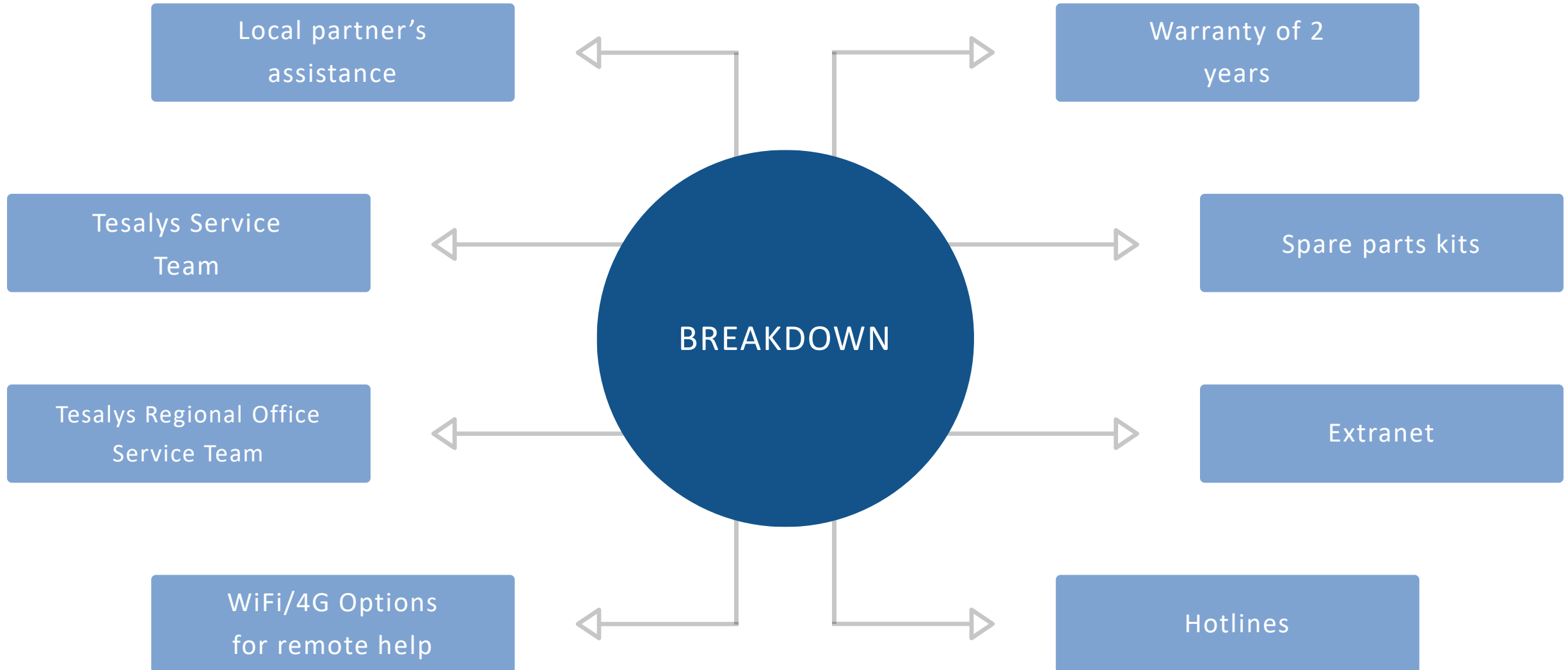
Done by the local partner.  
Local stock of spare parts needed.

4

### 1200 CYCLES MAINTENANCE

Done by the local partner.  
Local stock of spare parts needed.

# Troubleshooting & corrective maintenances



# Lifespan & decommissioning



- 10 years lifespan
- Decommissioning done by local partner or Tesalys Team
  - Unit made of E-waste & Metal waste
  - Contact local support to recycle as per local regulations



# CONTACT US



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THANK YOU FOR YOUR ATTENTION !

  
**Resalys**  
Making biomedical waste safe

## **03. Recap of HCWM Technical Series and Upcoming Capacity Strengthening**

## UNICEF Capacity Strengthening

### WEBINARS

- The 3-Webinar series will be published on the TechNet-21 HCWM Hotspot link: [TechNet-21 HCWM](#)
- Technical Guidance on how to choose the right technology – coming in Q2

### WORKSHOP/TRAINING

- Global Workshop on Technical capacities to maintain and repair Green and Safe Technologies – September 2024 (potentially in Mongolia)

### GUIDELINES

- Sustainable Health Care Waste Management – UNICEF PG
- Technical guidance on Green and Safe Technologies to treat infectious medical waste – UNICEF EAPRO
- Procurement guidance on how to use EAPRO LTAs to procure green and safe technologies