



COMPETITIVE STUDY: STERILWAVE VS NEWSTER

Bertin Technologies – Confidential

/ COMPARATIVE TABLE

	Newster	Sterilwave	
Product	Technology	Shock and friction	Microwave
	Range of product	NW 5 / NW 10 / NW 50	SW 100 / SW 250 / SW 440
	Capacity per product	Newster 5: 100 liters Newster 10: 152 liters Newster 50: 460 liters	SW 100: 100 liters SW 250: 250 liters SW 440: 440 liters
Process system	Shredding system	Shredding - rotatives blades	Rotative blades
	Time cycle	Highly depending on humidity and liquid quantity	+/- 30 minutes
	Temperature	155°C – under pressure (Up to 5,5 bars)	[100-110]°C – ambient pressure (safer)
	Bacterial inactivation	8log10	8log10
Resources	Consumption	<ul style="list-style-type: none"> - Water: More than 60 liters per hour - Personal: constant technician in case of jamming - Electricity: [13 to 25] Kw/h - Extra equipment: softener, boiler, draining system - Place required: Less than 20m² 	<ul style="list-style-type: none"> - Water: less than 1 liter per cycle (cooling) - Personal: Less than 10 minutes presence (no skilled operator) - Electricity: Approx 13 kWh - Extra equipment: Only Sterilwave - Place required: Less than 20m²
	Environmental impacts	Medium Liquid effluent to drain Highly demanding in electricity	Positive No liquid effluent to drain Only required electricity (low consumption)
Waste results	State	Wet	Dry
	Volume	80% reduction	85% reduction
	Weight	Increase of 20%	Decrease of 25%
	Odor	Still present (waste + water)	Odor reduction
	Storable	Not storable for a long period	Yes
	Recycled	No, can only be in a landfill	Yes



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CNIM group

In reference to Competitive Study: Newster VS Sterilwave shared by Bertin Technologies - CNIM GROUP and brought to the attention of Newster's headquarter in Italy, Newster System would like to point out the **following incorrect, false and malicious information and technical notes**. The comparisons made by CNIM GROUP are false and misleading, stating information that does not correspond to our technology as it is describe in the international reference **"Overview of technologies for the treatment of infectious and sharp waste from health care facilities"** published by WHO (known to those of the field as the **"Blue Book"** - <https://apps.who.int/iris/bitstream/handle/10665/328146/9789241516228-eng.pdf?ua=1>).

PRODUCT	Technology	The technology's name is <i>Frictional Heat Treatment FHT</i> , recognised and described in <i>"Blue Book"</i> where it is clearly indicated that the heat is generated by friction and impact of the waste against rotor blades. The waste is heated up to 150°C, while the waste is shredded into dry, small and unrecognizable pieces
	Range of Products	Newster® NW5 – Newster® NW15 – Newster® NW50
	Capacity of Products	NW5: 100 litres – NW15: 170 litres – NW50: 460 litres
PROCESS SYSTEM	Shredding System	High speed rotating blades (the rotor typically works between 1000 and 2000 rpm).
	Time Cycle	Average cycle time about 30-35 minutes
	Temperature	150 °C with a slightly negative pressure of the vessel. <i>FHT</i> technology NEVER requires vessel under pressure.
	Bacterial Inactivation	Newster respects the international standard STAAT Level IV that includes the use of bioindicator spore with 6log10 concentration. The 8log10 is non-scientific and non-reliable (ampoules with such concentration not available on the market). Farther Newster's residue is sterile at least 28 days from the sterilization process.
RESOURCES	Consumption	<ul style="list-style-type: none"> - Water per cycle: between 5-15 litres (NW5) to 75-90 litres (NW50) - Personal: the operator (not skilled) needs only to load/unload the machine - Electricity per cycle: from 10-12 kWh (NW5) to 35-40 kWh (NW50) - Extra equipment: none - Space required: 15 m² (NW5) - 25 m²(NW50)
	Environmental Impacts	Low. Newster's Life Cycle Assessment demonstrates a very low environmental impact. No POP's and hazardous emissions, no microbiological contamination of the condensed vapours. 30% Reduction of CO ₂ emission if compared with standard treatment (transport + incinerators).
WASTE RESULTS	State	Dry and Un-recognisable
	Volume	Reduced in Volume between 80%-85%
	Weight	Reduced in weight thanks to the liquid evaporation (15%-20%)
	Odour	Odourless due to the dry condition
	Storable	An easy and safe storage after treatment is possible thanks to the dry and sterile condition stable for at least 28 days
	Recycled	Thanks to the high calorific power (average > 18.000 kJ) the residue can be sent to the waste-to-energy plant. According to the France Law <i>"Order of 2019, 28th March on the implementation of an experiment on the recovery of waste from pre-treatment by disinfection of infectious and related health care waste"</i> (JORF n ° 0082 of April 6 th , 2019 Text n ° 14), the residue can be considered as Secondary Raw Materials <i>"SRM"</i> and sent to recycling plants (examples in construction sector).



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/ MACHINES OVERVIEW



Newster W5



Sterilwave 250

/ TECHNICAL FEATURES

		Newster	Sterilwave
Sterilization process	In a glimpse		
	Sterilization place	Shredder and sterilization made in 1 single vessel	Grinding and sterilization made in 1 vessel (vessel always sterilized)
	Particularity	Rotaries blades up to 2500 rpm, clockwise anti clockwise	Rotaries blades up to 1500 rpm, clockwise anti clockwise
Heat up solution	<ul style="list-style-type: none"> - Using of steam and microwave - Slower heating up (heat up from outside to inside the waste) 	<ul style="list-style-type: none"> - Using microwave for heating up the waste - Faster heating up (heat up from inside to outside the waste) 	
Mechanism	Complexity	Sophisticated mechanism (more equipment needed and complex shredder system)	Simple mechanism (plug and play solution)
	Risks and issues	<ul style="list-style-type: none"> - Under pressure [3.8 to 5.5 bars] - Some waste cannot be well-shredded due to their sharp (clockwise blades) - Long cycle if plastic and liquid (need to add glass) 	<ul style="list-style-type: none"> - Ambient pressure - Very thin waste due to rotaries clockwise and anti clockwise blades - Central blade S-form avoid jamming risk
	Maintenance	<ul style="list-style-type: none"> - Time spending maintenance - Longer maintenance purpose in case of jamming (complex shredder system) - More machine components compare to SW 	<ul style="list-style-type: none"> - Moderate maintenance costs (easy shredder system) - Easy maintenance purpose in case of jamming (all element are independent) - Machine components can be independly changed



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← NB: from the photos in the brochure, it is very clear, as Sterilwave rotor is a perfect copy of Newster rotor that is 25 years old.

STERILIZATION PROCESS	Sterilization Place	The demolition and the sterilization of the waste are simultaneous in one single vessel (always sterilized at the end of the cycle)
	Particularity	Rotating blades up to 2000 rpm run clockwise and anti-clockwise under PLC control for the energy consumption reduction and elimination of jamming problems.
	Heat Up Solution	The Newster FHT technology is based on the use of heat generated by friction and impact of the waste by rotor blades, supplemented by resistance heaters to ensure that the temperature can be adjusted only if required. The waste is heated up to 150°C, while the waste is shredded into small, unrecognizable pieces. Heat is provided by a rotor operating at high speeds (typically 1000 to 2000 rpm). A moist environment is kept inside the chamber by negative pressure, NOT POSITIVE.
MECHANISM	Complexity	Very simple machine, plug-and-play without any particular technical requirements.
	Risk and Issues	Due to the fact that the vessel is kept under slightly negative pressure, there no risks connected. Inside the chamber all the infectious medical waste can be treated all together (without any previous segregation) The PLC control and the possibility to change the rotation direction avoids the problem of jamming.
	Maintenance	Newster machine is completely modular in order to process the scheduled ordinary and extraordinary maintenance with low stop-machine time and without a high-skilled worker. The problem of jamming is solved with the control of motor energy consumption by PLC. The inner PLC data logger allows the remote control of the machine for a preventive maintenance.



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