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MEDICAL WASTE STERILIZATION SYSTEMS

Model: ARI-550:250

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TAKING CONTROL OF SOLID AND LIQUID MEDICAL WASTE



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ARI-550:250 Medical Waste Sterilization treatment

The **ARI** series bio-Medical Waste Sterilizers (MWS) assure bio-medical waste sterilization succeeded by accurate, homogeneous and guaranteed efficacy due to best contact of pressurized hot steam with the surfaces of contaminated and infectious waste materials.

Shredder: two-shaft shredder is integrated in the pressurized vessel to achieve guaranteed and homogeneous sterilization

All in one body design: Hopper, sterilization vessel and shredder are all in the same body without any external connections as bolt, screw, flange, etc. This design concept ensures safety, easiness and economy in operation

Pressure vessel from lid to lid: sterilization process runs from lid to lid at feed to discharge ends and the shredder blades are sterilized during process cycle

Emergency sterilization of shredder: if any work is required on shredder before the sterilization cycle is finished, emergency process runs and steam is sent to ensure safe handling

Pre-vacuum and post-vacuum: The loaded waste has some dead volume full of air which resist the contact with steam. To prevent the dead volumes, pre-vacuum is applied to remove the air inside the waste so that the steam sent afterwards can reach the entire surface of the waste. After the sterilization cycle, post-vacuum is applied to dry and cool down the sterile waste before discharge

Stainless steel construction: stainless steel is used to ensure long-life time and corrosion free system

Flexible software: ARI software can be designed to fit the local requirements in any country

Safe and easy operation: Because of the fully automatic design and simple operation, manual handling of the waste is at minimum level and the entire system can be operated by only one person

Generic steps in a treatment cycle:

- a) The waste is transferred into the feed hopper. Then prior to steam supply, vacuum is applied to empty the air holes which might resist and cause difficulties replacing with steam molecules during the steam apply. The entire system is automatically controlled and operated.
- b) The shredder starts operating and crushes to unrecognizable size, reducing up to 7 times the initial volume (~85%), and proper vacuum is applied to remove the air bubbles so that steam can penetrate deep in the inner volumes of the waste material before the steam is fed into the vessel.
- c) Then hot steam is sent to achieve the ideal sterilization conditions of temperature and pressure. After having reached to the plato stage, homogeneous sterilization conditions are hold and maintained for sufficient time according to EN-285 standard.
- d) After sufficient time of exposure to steam, sterilization ends and vacuum is applied to dry and cool down the sterile material and empty the steam inside through the vacuum pump.
- e) Then air is fed into the vessel and atmospheric pressure is ensured. Next step is the lid opening to empty the sterilize waste into the tank and the machine is ready for further cycle without any lead time. Then the system is ready for the further cycle to operate even 24 hours per day.



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(İmza)

Design Criteria and Features of ARI-550:250

ARI-550:250 assures up to 500 liters/hour capacity treatment. The system has an integrated built-in shredder, solid & liquid medical waste sterilizer, drying unit and steam generator designed for treatment of medical waste. Example of treated materials: syringes with needles, metallic objects (ex.: scalpels, electrodes, forceps & other tools up to 2 mm thickness, etc.), laboratory plates and tubes, glass objects, dialysis accessories, blood lines and infusion lines, paper and plastic containers, cloths and protective single use accessories (gowns, goggles, gloves, masks etc.), fabrics, wipes, paper and carton waste, organic materials and other biomedical waste.

Size reduction and sterilization of the medical waste carried out inside the waste vessel (WV). A two-shaft shredder is integrated in the pressurized vessel to achieve guaranteed and homogeneous sterilization. The WV is fitted with a motor-driven gearbox, with powerful shredding blades which can rotate in two directions to reduce the size and volume of the waste. To prevent the equipment blockage, the shredder is provided with automatic reverse rotation function. In case of overloading factors (overpressure, overtemperature, blockage, out of working conditions etc.) the device safely interrupts its running. The device is electrical protected against the short circuit for user safety.

The device should be connected only to electricity, drain and water supply. Unpleasant odors are filtered by replaceable HEPA filters (basic: 1 year of usage, 25 cycles/day; options available). For proper functioning the water should be filtered and RO treated, and 3-phased electrical line must assure the workload during the steam generating by built-in heaters (4x10 kW).

During a cycle all the data, inclusively temperatures ($\pm 1^\circ$) and pressures (± 0.1 bar) are displayed & controlled on color touchscreen panel, recorded and printed with a real time printer. Displaying is numerical and graphical, and can be optionally adjusted to additional user's requests, like languages (ex: Chinese, Romanian, Russian etc.), protocols, temperatures, displaying modes etc.



Picture.1. Example of equipment's front view complete in one body design

All in one body design: Hopper, sterilization vessel, shredder, vacuum pump and other key components are designed all in the same body. This design concept ensures safety, easiness and economy in operation.





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Technical parameters	MWS model: ARI-550:250
Treatment method	Pre-shredded Type, by Pressurized Steam Sterilization
Average Treatment Capacity	50 kg/h
Waste loading and processing volume	250 liters per cycle
Shredder Type	electrical, built-in, with 2 shafts
Loading type	Vertical loading from the top
Door type	standard: feed hopper cover
Door safety	standard: by special designed door lock
Controlling type	Microprocessor control unit, PLC
Interface	LCD color touchscreen, 10"
Printer	Built-in thermal printer, with printing of date, time, cycle step, pressure & temperature values
Active alarm system	Acoustical and visual (ex.: power cut-off, system error, sterilization error, door opened, shredder blockage, temperature error, pressure error etc.)
Language	English, Turkish
Sterilization Temperature	134 – 140 °C
Preset software programs	4 programs which can be chosen by user, leak test
Vacuuming	pre-vacuuming and post-vacuuming
Vacuum	by built-in electrical vacuum pump, water ring based
User protocols	Cycle process can be manually adjusted by user
Access control	Password protected for advanced settings
Self-disinfection	By sterilization auto-cleaning cycle
Steam Generator type	Electrical built-in
Steam generator water pump	Built-in
Compressor	Silent oil-free type
Sensors	Pressure and temperature sensors for steam generator, sterilization chamber, jacket
Real-time monitoring	Displayed on LCD touchscreen in values of time, pressure & temperature inside the sterilization chamber, cycle step, graphics
Double-check	Via built-in pressure manometers
Emergency stop button	On front panel
Security during sterilization	Electrical security against overheating, against overpressure Mechanical security against overpressure via security valve Electric safety switches, electromechanical pressure switches
Electrical Power Connection	380 V, 50 Hz, 3-phase
Sterile Waste Discharge	From the bottom door, with a specially designed stainless-steel box, automatic sliding type.
Drying of Sterilized Waste	by Vacuum
Protection against exhausted odors	Replaceable HEPA filters
Material of Sterilization Chamber, Steam Jacket piping, and steam generator	Stainless steel AISI-304
Isolation of sterilization vessel and steam generator	Yes
User protection against heat	External surface made in special rust-proof material which prevents the user against burns



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Applied standards:	PED-2014/68 / UE EN 60204-1 EN-285 ISO / IEC 12100-1 ISO / IEC 13445-1 ISO / IEC 60439-1 IEC 61000-6
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Available Options:

- Horizontal automatic Sliding door with dedicated safety system
- Automatic loading system, electrical powered
- Heat exchanger for drain cooling
- Other materials (ex.: AISI-316L etc.)
- RO system with included water softener, mechanical filters, water pressure control manometers – different capacities of RO water generated, water storage tanks (minimum capacity 100 liters), pumps
- Cart for waste
- New language
- New factory-preset protocols
- Connection to External Steam generator (heating sources: electricity, diesel, coal, wood)
- Connection to the hospital vacuum system
- Connection to the hospital air compressed system
- External coverage color
- Additional temperature ranges
- Operator's remote monitoring and control
- Other electric power connection values
- for other options ask your local UMB dealer