

# Sterilization

## E.O. Gas Sterilizer



### YSU-606 Steri Ethylene Oxide Gas Sterilizer

#### Introduction :

Sterilization by ETO involves alkylation of Micro organisms i.e. alternation of genetic cell material

Process variables that play an important role in the process are

- ETO Concentration
- Relative Humidity
- Temperature
- Exposure time

These factors are carefully monitored in order to ensure complete sterilization.

#### Applications of Gas Sterilization :

- In the health product and medical fields :
- Fiberoptic endoscope, surgical telescopes and other optical medical equipment.
- Ophthalmic instrument.
- Dental instruments.
- Plastic instruments (e.g. specula's, syringes,)
- Oxygen tenets anesthesia masks and circuits,.
- Artificial kidney machines, heart lung machines, cardiac pacemakers.
- Rubber and plastic tubing (e.g. catheters), surgical gloves, sheets, tubing.
- Cotton balls and pads, swabs and bandages.
- Electrical equipment (e.g. drills, pumps, motors).
- Respirator and inhalation therapy supplies.
- Surgical staplers / staples, sutures, sharps.

#### Salient Features :

- Cubical cabinet type model easy to install, less space requirement, elegant in look.
- The chamber is sq. / rectangular in shape constructed of heavy duty stainless steel 304 / 316.
- Specially designed coils to maintained uniform temperature in the chamber.
- Compact hot water circulation system.
- Humidification arrangement.

#### Design:

##### Chamber

Chamber is made of stainless steel. The rectangular section of the chamber is re-inforced with U-Profile jacket welded around the chamber. The chamber is insulated by resin-bonded glasswool covered by M.S./S.S. and performance as per BS & IS standards.

- Flame – proof design of the sterilization chamber with no spark – generation devices being mounted on the machine.
- Specially designed gas scrubbers for converting Ethylene Oxide to environmentally friendly Ethylene Glycol.



- Emergency evacuation system for rapid evacuation of the gas in case of emergency.
- Autoclave working pressure of 30" Hg to 1.2 kg/cm<sup>2</sup>.
- Autoclave is designed specially for cartage type 100% EO gas with necessary safety features.
- Door gasket design is expansion type silicon.

#### Doors :

The unit is provided with One /Two Swing/Sliding (Optional) doors moved horizontally

Doors are provided with the following features :

- Double gasket sealing for safer operations(Optional)
- Process lock to prevent opening of the door during the process.
- Door interlocking for double door Model to prevent simultaneous opening of both doors (Optional)
- Heating jackets to ensure that the internal surface of the door have the same temperature as the chamber

#### Hot Water Generator

The Generator is fabricated form S.S. 304 Sheets with industrial immersion heaters. The steam generator is provided with automatic pressure control and other safety features like low water cut off to safe –guard heaters, safety valve gauge glass.

#### Vacuum System

Rotary vacuum pump driven by 3 phase electric motor.

The other salient features are :

- Settable evacuation rate to suit packing material
- Emergency evacuation phase for fast evacuation of gas incase of emergencies



### Safety:

Following safety features have been provided to ensure maximum operator safety .

- Door closing and sealing as a precondition for start of the process
- Process lock to prevent opening of the door when the process is ON
- Double gasket for improved & fail proof door-sealing
- HI / LO temperature and pressure alarms

### Process Control System :

- All sterilization processes are controlled by a Microprocessor based Process control System (PCS)
- Due to the wide variety of products sterilized in our system, many of which have entirely different packaging materials or pack sizes etc. the process control must be capable of extreme flexibility. It is of great value to our machine users to be able to change and develop process programs to satisfy their needs for superior products quality at optimum running cost.
- All control system are provided with a user friendly Man Machine interface for communication with the Microprocessor. This microprocessor combines flexibility with accuracy. Some of the salient features which can be incorporated in the system are :

- Capability of storing and running upto 6 different programmes
- All process parameters can be easily changed
- Pass-word protection to prevent unauthorized access.
- RS-232 output for down-loading critical process parameters for report generation
- Data Acquisition Systems for process Log and report
- A Comprehensive selection of alarm functions are also available
- Medial failures (Gas, Water, Air, Steam, electricity)
- Temperature and pressure alarms, Time too long for different phases.
- Gas leakage in the work area,
- Insufficient feeding of ETO Gas etc.

### Documentation and Validation

On special request design and manufacture of sterilization plants can be done in accordance with EN-550 for CE Mark. Machines can be supplied with :

- Design Qualification Report (DQR)
- Installation Qualification Report (IQR)
- Factory Acceptance Test (FAT)
- Performance Qualification Report (PQR)
- All assistance for on site validation and audit also guaranteed.

### Technical Data :

1. Main Feature	E.O. Gas Sterilizer
1.1 Item	
1.2 Chamber Size	410×410×850 (5cft.) 450×450×1200 (8.5 cft.) Other sizes as per customer requirement
1.3 Sterilization medium	100% /EO Gas (Single use disposable cartage)
1.4 Material	Chamber : SS 304 / 316 Door : SS 304 / 316 Piping : SS 304 / 316 Gasket : Silicon Paneling : MS Powder coated / SS 304
1.5 Controls	Microprocessor base control LCD Display : Chamber Heating, Pressure, Vacuum, Humidification, Gas Injection, Sterilization, Aeration & Sterile
1.6 Program	The following programs are located in the PLC with automatic aeration cycle 1. Warm Cycle at 55 to 60° C for 220 to 250 Minutes 2. Cool Cycle at 35 to 45° C for 300 to 350 Minutes 3. Selectable Cycle with programmable parameters
1.7 Accessories	1. Aeration hood built in 2. Sealing machine with timer up to 350mm sealing width (optional) 3. Air compressor (optional) 4. Gas exhaust treatment / dosing unit built in 5. Electronic gas leakage detection system (optional)
1.8 Recording of Operational parameters	Built in printer (optional) for recording cycle parameter such as Temperature, Vacuum, Batch No., Aeration time etc.
1.9 Utilities & Environment	Power supply : 230 V Single Phase 50 Hz. AC Distill Water : 2 Lts./ Cycle Overall Sizes : 850×1600×1120 / 1000×1700×1500 (W×H×D) Air Pressure : 5 kg. / cm <sup>2</sup> max. 50 lpm