Industrial Air Purification

Vacuum Degassing Chamber

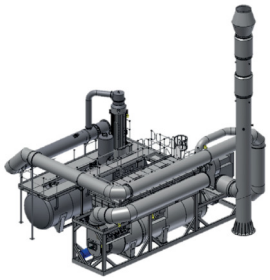
Ethylene Oxide Sterilization of Medical Devices

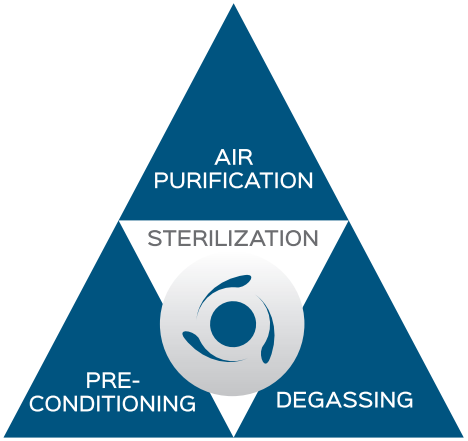
LESNI®
The Air Purification People

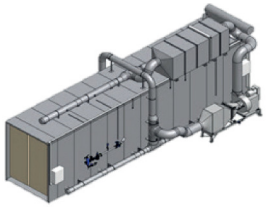
LESNI develops and build the first pilot degassing chamber for testing and hire

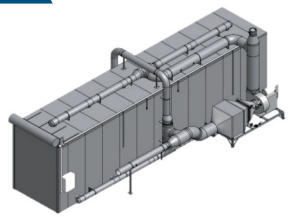
When using EtO to sterilize medical devices sufficient degassing post sterilization is required; sometimes also additional secondary aeration of these medical devices are essential to reduce residual EtO levels to within acceptable limits complying with current European and international legislation.

Aeration time may vary and is related to product type and different materials used, for this reason it is very important to have an efficient degassing and aeration stage to remove remaining EtO gas. The design and operation of such degassing chamber should speed the rate of evaporation of the absorbed gas again from the sterilized items.







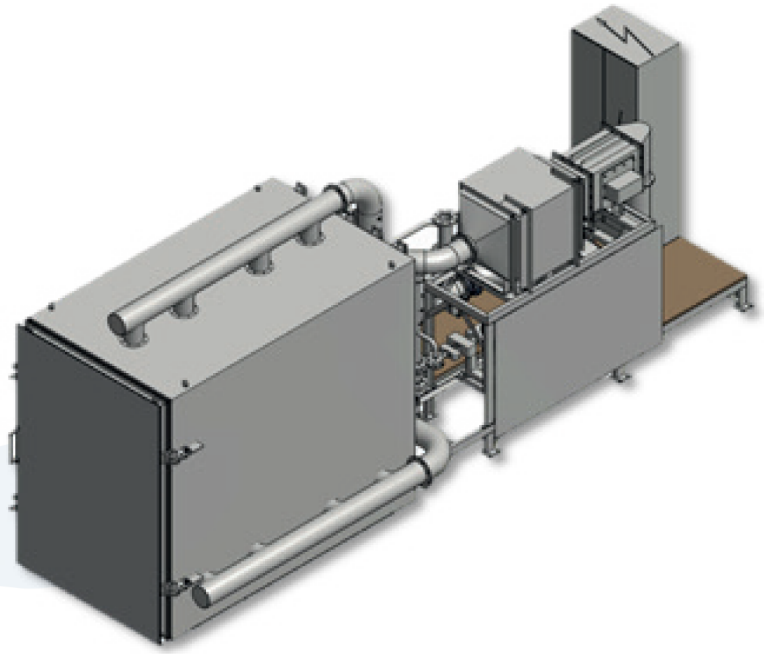


Vacuum Degassing Cell

The use of LESNI accelerated Degassing Cell and / or Vacuum Degassing Cell after sterilization can significantly reduce the post sterilization cycle time, and thus the need for large quarantine aeration rooms, while ensuring optimized treatment and purification of all fugitive emissions in the final Catalytic Abatement Plant.

The Pilot Vacuum Degasser available for testing and optimizing degassing cycle time is constructed to withstand shallow vacuum intervals of up to 700 mbar, unit is built for use with 3 EU pallets for optimum results. With facility to control temperature, relative humidity and air flow circulation, a standard accelerated air circulation feature of LESNI degassing cell. Together these features should accelerate the evacuation of the residual ethylene oxide out of the packaging and products during aeration with heated air.

The rapid degassing of EtO under slight shallow vacuum expected to reduce time of degassing by 65 % or more depending on the vacuum break performed. While the Vacuum Degassing Cell will function in the same manner as standard Degassing Cell via selectable cycle parameters from the operating system.



Developing the Optimum Degassing Cycle

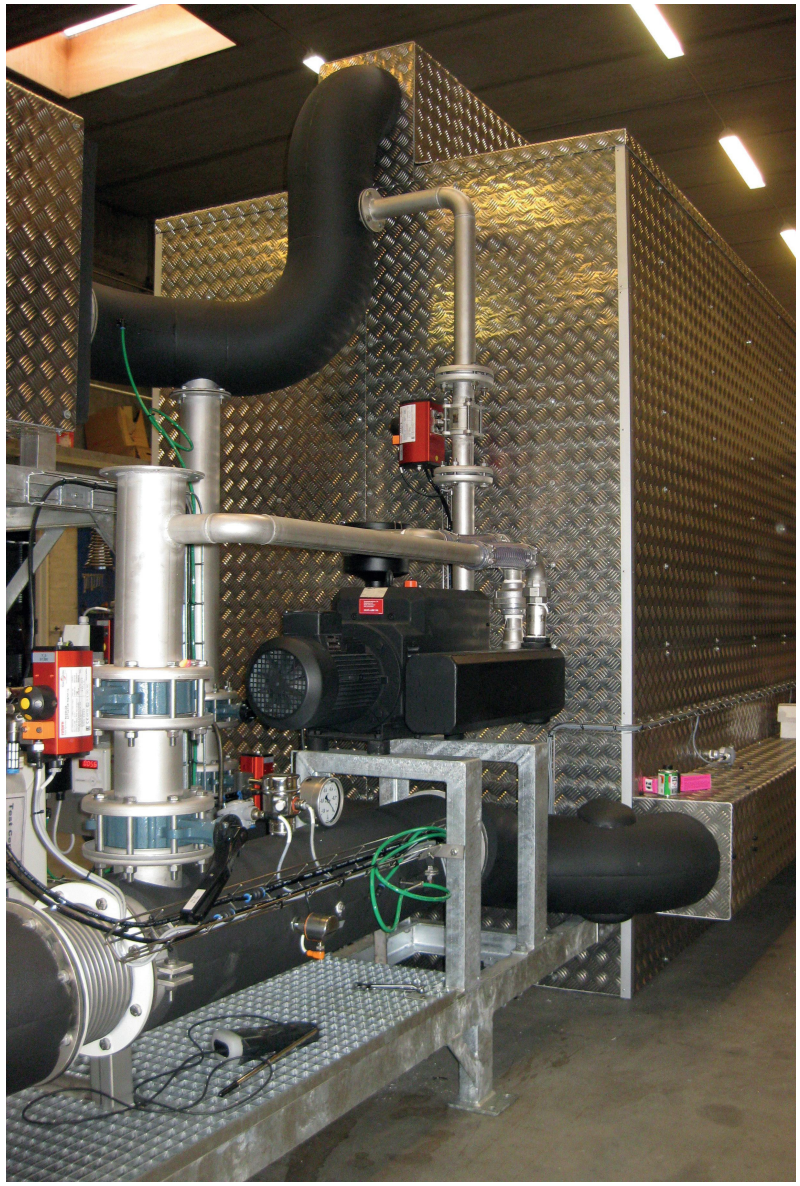
When loaded with sterilized product the cell door will be closed and sealed, with turbulent air circulated evenly around the product to give a homogenous atmosphere mix. This circulated atmosphere will then be heated to the cycle selected temperature point and maintained.

Shallow vacuum intervals varying between 50 mbar and 700 mbar will follow at defined period to suit individual medical device product. Hold period of vacuum is attained and then atmospheric air break is performed. These vacuum/air breaks will continuously be performed for the selected duration of the degassing cycle phase in line with cycle recipe selected parameters.

Vacuum Degassing Cell Features

Similar to standard Degassing Cell, a minimum air circulation rate will be targeted to achieve necessary turbulence throughout the cell. Also the air flow will be distributed and balanced along the full length of the cell to give an even distribution of cell temperature and air flow conditions throughout the load. The inlet and outlet ducting will be designed to give the best atmosphere flow across the surface of all the product within the cell.

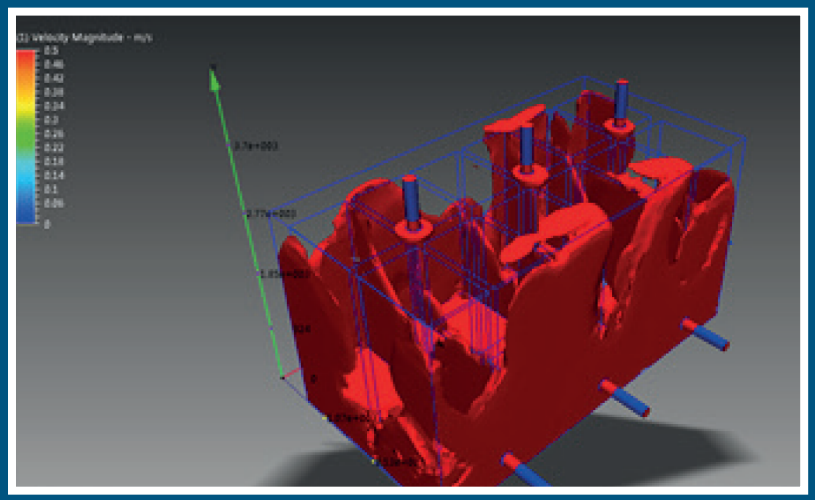
- Extraction of the internal cell atmosphere will be achieved by the vacuum pumping system and diverted to the final LESNI Catalytic Abatement Plant.
- The Degassing Cell walls and door will be insulated all around to maintain a temperature variation across the free space of the cell.
- A suitably sized vacuum pump will be fitted to extract degassing cell in a short time.
- An air break from vacuum to atmospheric pressure will be installed to vent Degassing Cell in a similar period of time.
- The Degassing Cell for this application will be constructed as a standalone cell / chamber to be placed on the floor adjacent to the sterilizer.

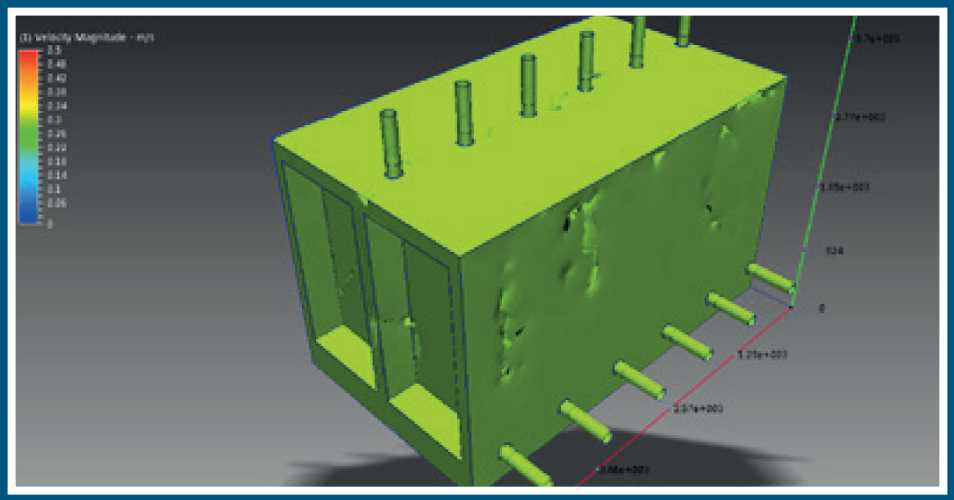


Design

With the LESNI Vacuum Degasser the products are in a temperature controlled environment, designed to ensure turbulent but accelerated air speed around the product to improve gas evaporation and reduce the degassing time.

Optimization of velocity and flow in Vacuum Degassing Chamber with simulation software to determine the position and number of venting nozzles which can achieve the optimum conditions for accelerated air flow.



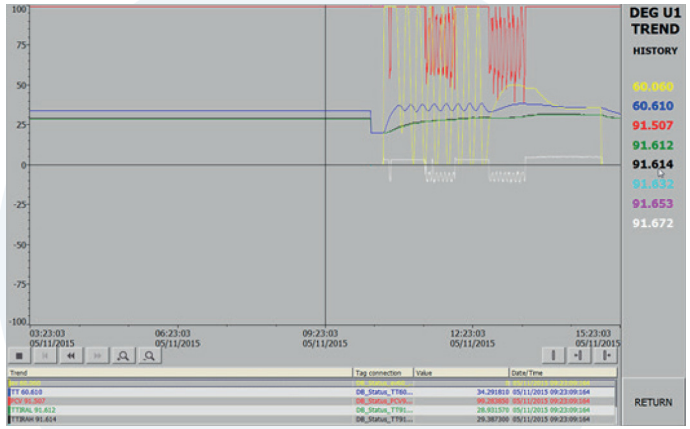


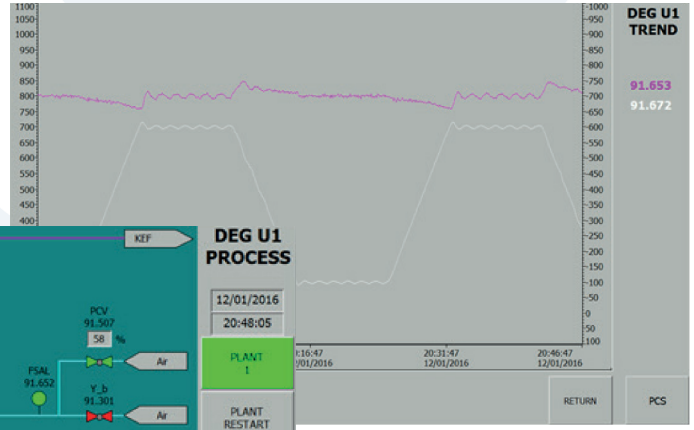
Safety and Control

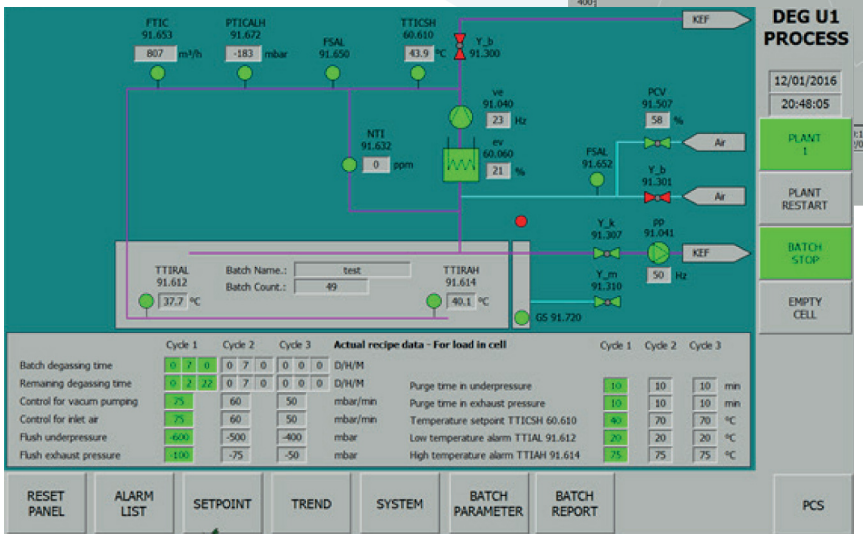
PLC process overview of Vacuum Degassing Chamber with control panel equipped with touch OP - operating panel providing interface with the pilot unit to supervise operation of the chamber.
Several data and parameters for each cycle and corresponding recipe can be individually entered, such as:

- Batch degassing time
- Temperature in chamber
- Under pressure
- Exhaust pressure
- Purge time in under pressure
- Purge time in exhaust pressure

Different diagrams and curves are available and recorded for optimized visualization and transparency of degassing process.







LESNI®
The Air Purification People

Air purification by physical and chemical scrubbers

Activated carbon plants for VOC purification, odour removal and solvent recovery

Air purification systems for removing mist, dust and particulate matter

Safe and efficient catalytic and thermal oxidisers for VOC purification and solvent destruction

LESNI has developed a variety of innovative solutions for specific pollutants and processes in operation worldwide

LESNI®

The Air Purification People

LESNI A/S
Kornmarken 7
DK-7190 Billund
Denmark

Tel.: +45 7533 2500

sales@lesni.com
www.lesni.com