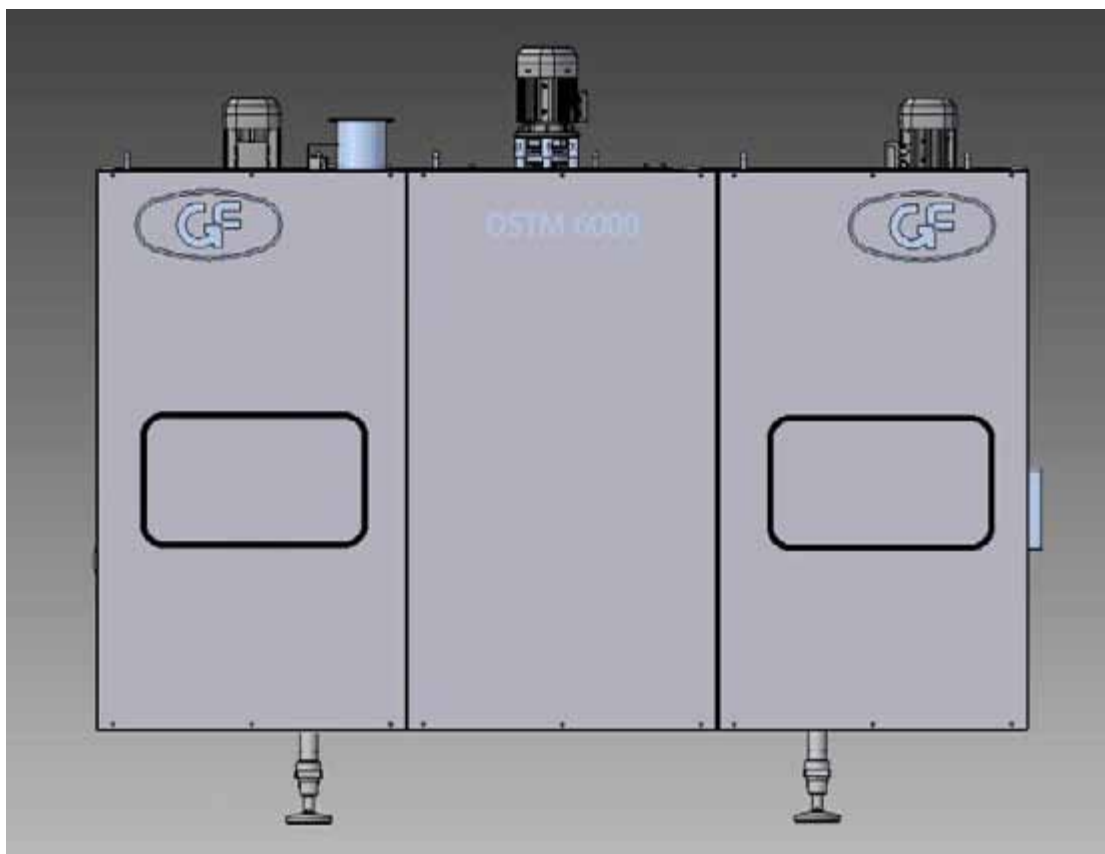




Pharmaceutical Machinery Division

STERILIZATION TUNNEL



D
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M

Sterilization and Depyrogenation Tunnel

Rev. 00

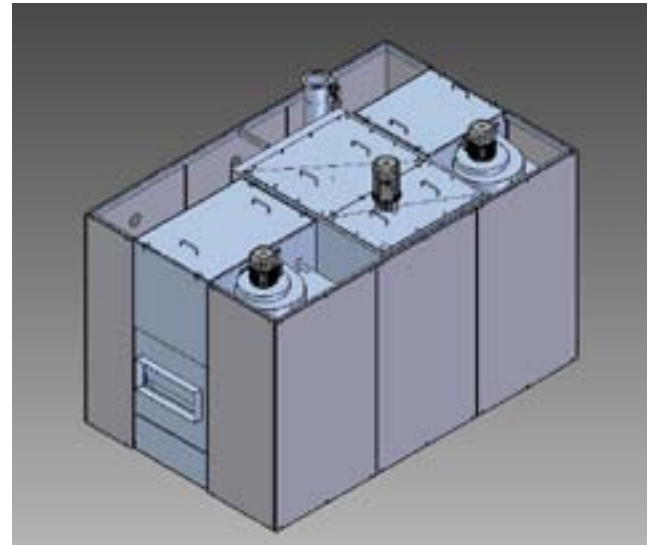
STANDARD FEATURES

The DSTM is a tunnel designed for the sterilization and depyrogenation of glass containers of various sizes with a high degree of accuracy and reliability.

High quality steels are used for the internal parts subject to particular thermal shock; these steels have a high degree of stability even at the highest working temperatures.

This tunnel is a laminar flow type: the sterilization process takes place by means of hot air recycled and filtered with absolute filters.

Air heating takes place with stainless steel, fanned, low heat inertia batteries installed on the recycle fan intake.



Main Parts

Conveyor belt

The conveyor belt is made from a stainless steel mesh with vertical side-rail wings which aid in the elimination of friction between the vials and the walls of tunnel's chambers. The return of the conveyor belt is through a closed duct connecting the cooling and inlet chambers. The hot chamber is totally avoid.

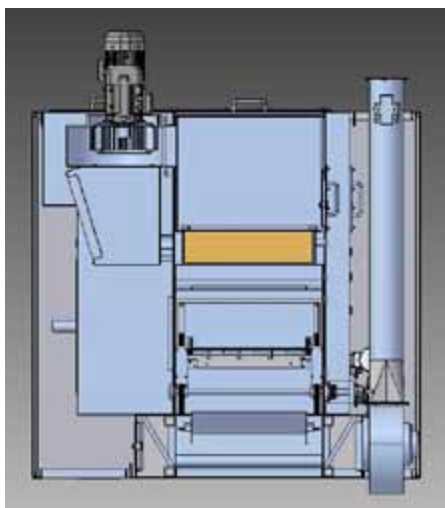
The conveyor belt speed is automatically adjusted by PLC according to the vial type being processed.

Chambers

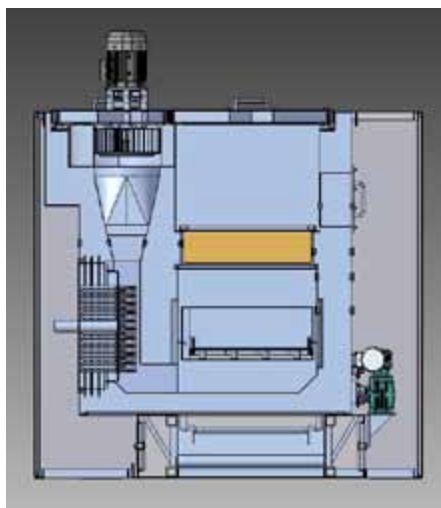
The doors between inlet chamber and hot chamber, hot chamber and cooling chamber, and between the cooling chamber and the sterile room are operated automatically according to the vial being processed.

On tunnel start-up the PLC controls the doors as follows:

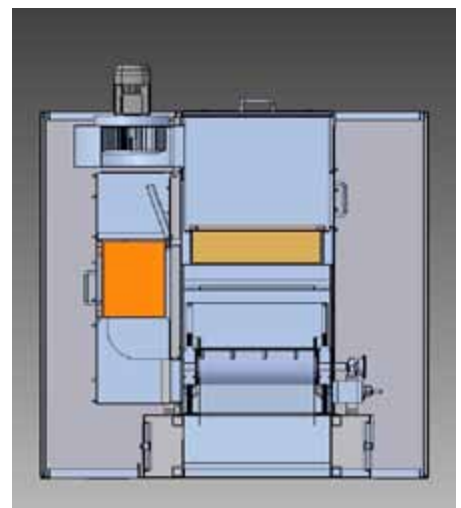
1. at start all doors are closed;
2. once the vials arrive close to the hot chamber the first door lifts automatically;
3. once the vials arrive to the end of the hot chamber the second door lifts automatically;
4. once the vials arrive at the exit of the tunnel the last door lifts automatically or according to the clean room operator's consent;
5. at the end of the production the doors are closed automatically.



Inlet Chamber



Hot Chamber

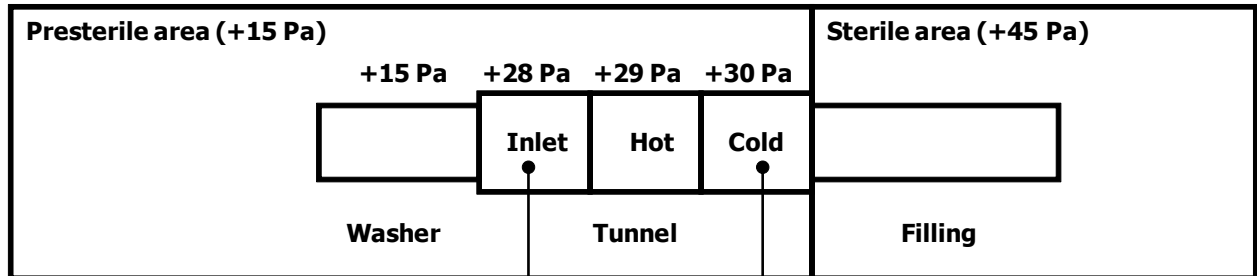


Cooling Chamber

Automatic air balance

The tunnel is always in overpressure compared to the outside room, and because of this there is no bacteria or particles contamination.

The pressure decreases progressively from cooling chamber to inlet chamber, and because of this there is no contamination from inlet chamber to already sterilized containers.



- Pressure transmitter for differential pressure between cooling chamber and inlet chamber.
- Exhaust fan to keep this differential constant (approx 2 Pa).

- Pressure transmitter for differential pressure between cooling chamber and room.
- Exhaust fan to keep this differential constant (approx 15 Pa).



Accident - Prevention Project



GF designs and manufactures its machines with the aim of reducing and, where this is possible, eliminating hazards by constantly improving the numerous safety features.

These tunnels are constructed according to cGMP regulations.



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Laboratory of industrial research

Art. n. 14 of ministerial decree n. 593 of 8 august 2000

*Ministero dell'istruzione,
dell'Università e della Ricerca*

AGENTE - AGENT

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