

STERILBEAM

Energy based Cap Sterilization

Sterilbeam, GEA Procomac's caps sterilizer, provides sterile caps to the capper inside aseptic bloc, transforming the sterilization concept from chemical to energy based. Sterilbeam uses low-energy electron beams to sterilize cap surfaces in-line with clear advantages: energy is available on site allowing a shorter transmission chain, there are no residuals of sterilization on the final product and the treatment time is in terms of milliseconds. Simple electron emitters are used to produce electrons and convey them into beams. These beams are then directed to the caps surface, killing any possible microorganisms that may be present by breaking and forming new chemical bonds in their molecules (accelerated electrons act at biological level). During production, only

voltage, current & time are monitored. No chemical consumption occurs during production; pre-sterilization of the environment is achieved using vapor hydrogen peroxide. The machine is about 4 m long, 2 m wide and 3 m high; its weight is around 4 tons – mainly due to lead shielding. A shielded cap channel is created by the closure of a movable part onto a static one. Shielded boxes house electron emitters on both the static & movable sections. The main concern with low energy electrons are X rays, but as electrons cannot escape metal enclosure, a lead enclosure is enough to stop all harmful radiation. Additional safety devices have been introduced to avoid any accidental radiation exposure, such as interlock switches for shielding doors and opening.

Process Engineering

GEA Procomac S.p.A.

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The emitter windows irradiate the middle section of the cap channel which is S-shaped. The cap sorter unit orients and feeds the caps along the treatment channel. The channel is equipped with a spacer wheel to space the caps when they move in front of the irradiation window. Caps channel has an easy access and it

sealed by a gasket.

Caps are delivered through the electron cloud and are sustained by guide rails. The guided channel is sloped and caps move by gravity. The shielding is mounted on a stainless steel frame. The sterile air system, for channel pressurization, is placed behind the

channel. Behind this system there is the electrical cabinet, housing the emitter's power supply and all of the electronics. On the top of the frame, a cap sorter feeds the caps channel, while a chiller on the lateral side provides water cooling for the emitters.

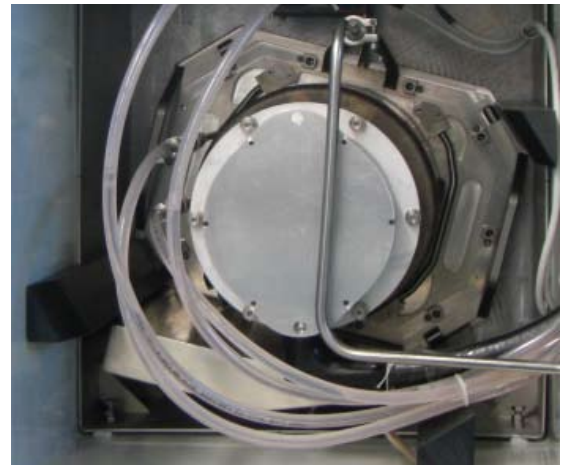


Picture 1.

Timing starwheel: detail of the cap's spacer wheel at the inlet of the irradiation chamber with Omega shaped caps rails.

Picture 2.

Low energy emitter: detail of the rear side after opening of the leaded box.



Features

Sterilbeam provides sterility using a dry process. No water is required and the machine validation is easier too, since it can be carried out without any biological indicator (BI) testing. Only doses delivered to caps need to be measured and confirmed.

Sterilbeam can process different caps format (28 – 38 mm) and geometry (flat or sportcaps) on the same unit with simple and fast changeover and run up to 600 cpm.

Advantages

- Dry and sustainable technology
- No chemical consumption during production
- No water consumption
- Reduced piping footprint
- Ability to process flat and sport caps on the same line
- Ability to process 28 and 38 mm caps on the same line
- Speed up to 600 cpm
- FDA approvable process



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