Practical Implementation of In-House Electron Beam Sterilization

Answers to unanswered Q&A questions

Question 1: Excellent presentation. What is ATS' experience designing Ebeam system self-shielding, in order to achieve the typical external radiation level for being placed in an unrestricted facility area?

Answer 1: As discussed on the call, our previous solutions were custom in nature. Our experiences there have taught us to trust the experts. So, for the configurable system presented, ATS's mechanical engineering team has worked closely with experts at our radiation shielding partners to develop a shielding solution that is appropriate for a life sciences manufacturing environment.

Question 2: I guess this depends of the application, but what is a typical range for machine price?

Answer 2: As our offering is a configurable standard, portions of the system will be custom to each customer based on their product, manufacturing workflow, and install location. As such, ATS needs to go through our applications and quoting process to provide you with a price of a system that meets your needs. Customers who have received similar pieces of equipment from us have stated they are realizing better than a 3 year ROI with where the all in investment is landing.

Question 3: Are the nest customizable? is the product sterilize directly to the primary packaging or is there a possibility to sterilize using the final packaging (Boxes)?

Answer 3: Yes, the nests are fully customizable. Depending on product configuration, we can either machine pockets in the nest to holster your product or develop a custom bin to be placed on the conveyor which holds one or more or your product.

Given the lower LINAC energy produced by the ATS system (3-5 MeV), sterilizing after final packaging is highly dependent on the pack out configuration. In a case where you have a single layer of product (w/ sterile barrier in place) in a low-profile box such as the one shown below, this could be feasible but would impact throughput. High density/multiple layer packaging however is not the intended use case for this system. If this is how you would be interesting in running your workflow, send us your boxed product and we'll perform analysis and dose mapping!

Question 4: If the product speed is very high, can be the LINAC doubled to achieve the required throughput?

Answer 4: Our current solution only supports a singular LINAC unit and a 2x LINAC solution is not in development at this time.

Question 5: Assuming a 2kW beam do you have any information on utility costs per hour of run time? Any benchmarks you have at this time?

- Does it pulse the power or stay on consuming the 2kW per hour?

Answer 5: The E-beam would run consistently so long as parts are passing beneath it. The 2 kW referenced is the output power, not the input power to the system. Power consumption (including LINAC, conveyance, and other hardware) is estimated to be approximately 150 kW. Operating costs for this are heavily dependent on your location and associated electrical cost/kW-hr.

Question 6: Considering the relatively low energy (<10 MeV) of the Sterilization System, is there an Ozone production issue caused by the electrons in air, and if so, how is the Ozone handled and neutralized?

Answer 6: Just to clarify first, our offering does max out at 5 MeV. To answer your question, you are correct that there would be ozone produced by the sterilization system. The system includes ventilation ducts which would connect to facilities level fume extraction/ventilation to exhaust any ozone generated outside of the facility.