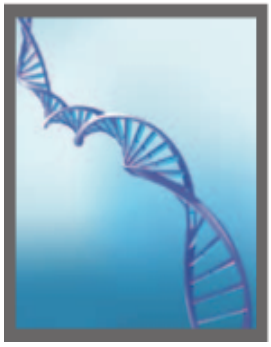
The Power of Electrons

Electron Beam Sterilization
at E-BEAM Services, Inc.

Electron beam sterilization (e-beam) is a commercially proven technology for sterilizing a wide variety of disposable medical devices with a wide range of densities.



The e-beam radiation inactivates microorganisms either by causing microbial death as a direct effect of the destruction of DNA molecules or by an indirect chemical reaction which results in microbial death.

How It Works

The principle of electron beam technology is similar to that of a television set cathode ray tube. The e-beam accelerator creates a beam of electrons 0.5 inches in diameter and energizes it to near light speed. The beam passes through a scan chamber where a magnet scans it back and forth at 200 Hz, creating a curtain of electrons 4 feet wide. A high-speed conveyor carries cartons containing products to be sterilized under the beam, where an accurate predetermined dose of radiation is delivered.

Why Use Electron Beam?

The sterilization process is precisely controlled by advanced electronics. Process parameters are recorded for accuracy of dose and validation purposes. For many materials, the speed of e-beam processing results in less material degradation than with gamma irradiation.

Typically, medical products are irradiated in the original shipping containers, thus saving the customer time and maintaining package integrity.

Advantages of E-Beam Sterilization Over Ethylene Oxide (ETO)

- *Faster turnaround*
- *No quarantine*
- *No residuals*
- *Greater mixed lot flexibility*
- *One process variable*
- *Lower cost*

Advantages of E-Beam Sterilization Over Gamma Radiation

- *Faster turnaround*
- *No radioactive source*
- *Less material degradation*
- *Greater mixed lot flexibility*
- *No negative public perception*
- *Lower cost*

E-BEAM Services, Inc.
Contract Electron Beam Processing
www.ebeamservices.com

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Product Applications

E-Beam sterilization is routinely used in many applications with a high level of customer satisfaction. Here is a sampling of commercial e-beam sterilized products . . .

- Drug Containers
- Labware
- Bandages
- Syringes
- Catheters
- Tracheostomy Care Kits
- Sponges
- Woven And Non-Woven Goods
- ... and many more

Below are just some of the materials that can be sterilized successfully with e-beam processing in sterilizing dose ranges . . .

- Polyethylene
- Polypropylene
  This material is only processable using electron beam radiation and typically can not withstand gamma radiation.
- Polystyrene
- Polyethylene Terephthalate (PET)
- Polyamides (Nylons)
- Polycarbonate
- Acrylonitrile-Butadiene-Styrene (ABS)
- Polyimides
- Polyurethane
- Polysulfones
- Polyesters
- Elastomers
- Natural Rubber (Latex)
- High Performance Polymers
- ... and others

Product Validation Requirements

E-BEAM Services, Inc. provides a complete validation package consistent with AAMI guidelines, including written protocols and guidance to transfer a given product from its current method of sterilization to the e-beam method. The dosimetry and equipment calibration are traceable to NIST.

Our Services

Some of the services that we offer include:

- Material Compatibility Testing
- Dosemap Testing
- Verification Dose Auditing

In addition to sterilization, E-BEAM Services offers electron beam processing services for crosslinking of plastics, rheology control of polymer pellets, polymer chain scission and semiconductor enhancement.

Why Choose E-BEAM Services?

E-BEAM Services, Inc. is a leading supplier of contract electron beam processing services for product sterilization with more than 500 kW of installed accelerator capacity in three processing facilities . . .

Lebanon, Ohio: Two 5.0 MeV accelerators with combined 300 kW of capacity
Cranbury, New Jersey: A 4.5 MeV accelerator with 150 kW of capacity
Lafayette, Indiana: A 1.5 MeV accelerator for wire, cable and tubing processing

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