E-BEAM TECHNOLOGY

Today's most modern food & pharma technology

Pak Electron Beam Irradiation (Pvt.) Ltd.
EXPERTISE & EXPERIENCE

The management of PEBL carries over 20 years’ of experience in food dehydration, processing and safety control measures including ETO treatment.

We, a group of companies, have decades of experience in the field of food processing and preservation, and have provided services of international standards at our processing facilities in Pakistan. We have proven record for processing of vegetables, spices and fruits, ensuring quality by controlling the entire process from farming to dehydration/processing to final packing and shipment.

We are thoroughly experienced with successful business transactions with national, multinational and foreign companies.

We are knowledgeable of the latest food processing technologies through strong association with academia, food-processing organizations, attending seminars, participating in international exhibitions and visiting modern facilities. We are also a member of IIA, International Irradiation Association, UK. We have associates with extensive experience in irradiation and food technology.
PAK ELECTRON BEAM IRRADIATION (PVT.) LTD

Electron Beam (EB) is today’s most modern food processing ‘Green Technology’ available to eliminate disease-causing microorganisms from food and pharma products. EB Irradiation is the future technology for food safety and shelf life extension of food products, insect control and high-speed sterilization of medical devices and pharmaceuticals.

OUR INITIATIVE

Pak Electron Beam Irradiation (Pvt.) Limited, PEBL, has installed in the first Electron Beam (EB) Accelerator Plant in Pakistan, in October 2018, under the supervision of international experts, at North Western Industrial Zone, Port Qasim, Karachi, near to exporting and importing sea ports of Pakistan.

The EB plant has adequate Irradiation treatment capacity to cater to the needs of food, pharma and allied industry in Pakistan.

PEBL is owned and managed by the persons having many years of experience in food processing technologies.

The EB plant will be working under Total Quality Management System (TQMS) and under all international codes and guidelines for the total satisfaction of customers.

The irradiation facilities of the PEBL-EB-plant have been approved by the PNRA, Pakistan Nuclear Regulatory Authority.

The EB plant will be working under TQMS, Total Quality Management Systems and under all International Codes and ISO Guidelines for the Total Satisfaction of Customers and related national and international Authorities.

OUR MISSION

To promote new and modern technologies in processing and trade of safer food, pharma and other products for human and animal use around the globe.
WHAT IS E-Beam TECHNOLOGY?

Electron Beam (EB) is today’s most modern food processing ‘Green Technology’ available to eliminate disease-causing microorganisms from food and pharma products. EB Irradiation is the future technology for food safety and shelf life extension of food products through eBeam Pasteurization (phytosanitary control) and high-speed sterilization of medical devices and pharmaceuticals.

In the United States, the FDA, USDA-FSIS (Food Safety and Inspection Service) and the USDA-APHIS (Animal and Plant Health Inspection Service) have approved a number of food and produce items for use with this technology.

Electron Beam (E-Beam) processing is the method where products are exposed with accelerated electrons and as a result, the microbes are deactivated in the product. The mechanism involves breakage of DNA of the microbe thus rendering it unviable.

THE ELECTRON BEAM TECHNOLOGY

- Reduces and eliminates diseases-causing microorganisms;
- Increases shelf life of food products;
- Controls Insects, Larvae and Eggs;
- The nutritional value is essentially unchanged;
- Energy source is electricity (i.e. non-radioactive)
- Is extremely efficient and has short treatment times

E-Beam processing has become an important weapon in the food safety arsenal to fight against the spread of microorganisms and insect pest in many advanced countries.

Irradiation of food and pharma products with E-Beam does not make them radioactive, as the process does not involve radioactive material.

Unlike other methods of treatment, E-Beam technology allows treatment even in the final packaged product.

Many countries of the world have adopted EB technology for the safety of food and pharma products.
E-BEAM APPLICATIONS

There are many sectors that may be benefitted from the use of EB technology not only for ensuring health and safety of human being, but also for enhancing quality and economic returns.

**Food Processing:** Eliminates pathogens like Salmonella and E.coli from meat, fish, fresh & dried fruits, spices, vegetables and herbs and extends shelf-life with no change in nutritional value and quality. E-Beam inactivates eggs and larvae of harmful insect pests and destroys live insects.

**Sterilization of Medical Products:** Destroys microbes.

**Disinfectations:** Destroys pest and microbes in wheat, rice, spices etc.

**Water Purification:** Sterilizes water for cosmetics or medical use.

**Waste Water:** Breaks down numerous chemicals that contaminate water.

**Packaging Material:** Eliminates harmful disease-causing pathogens from plastic bottles, paper containers and other packaging.

**Wire & Cables:** Abrasion resistance, high temperature resistance and chemical resistance.

**Gem Stones:** Colour enhancement

**Polymers:** Degradation of Polymeric Material

**Mail:** Mail treatment in order to prevent harmful biological contamination
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<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
<th>Net Gain</th>
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<tbody>
<tr>
<td>Faster Turnaround</td>
<td>Reduced inventory</td>
<td>$ Savings</td>
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<tr>
<td>Flexibility</td>
<td>Quick dose changes</td>
<td>$ Savings</td>
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<tr>
<td>Less material degradation</td>
<td>Custom tailored processing</td>
<td>Customer Satisfaction</td>
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<tr>
<td>Uniform, controlled dose</td>
<td>Reduced risk of product damage</td>
<td>Safer product</td>
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<tr>
<td>No radioactive source</td>
<td>Precise dose delivery with no shielding from</td>
<td>Easier qualification</td>
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<tr>
<td></td>
<td>other products</td>
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<tr>
<td>No re-sourcing required</td>
<td>No security, transportation, or disposal</td>
<td>Consistent quality with customized dosing</td>
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<td>concerns</td>
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<td></td>
<td>On/off technology</td>
<td>Environmentally friendly</td>
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<td>No radioactive cobalt resupply downtime</td>
<td>Long term service stability</td>
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<td></td>
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<td>$ Savings</td>
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<td></td>
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<td>Uninterrupted processing capability</td>
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Source: EBSI.
<table>
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<tr>
<th>Feature</th>
<th>Benefit</th>
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<tbody>
<tr>
<td>Lower cost</td>
<td>Lower price</td>
<td>$ Savings</td>
</tr>
<tr>
<td>No residuals</td>
<td>Product immediately useable</td>
<td>Simplified inventory management</td>
</tr>
<tr>
<td></td>
<td>Safer product</td>
<td>No OSHA concerns</td>
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<tr>
<td></td>
<td>International acceptability</td>
<td>No EPA/Environmental concerns</td>
</tr>
<tr>
<td>Faster turnaround</td>
<td>Reduced inventory</td>
<td>No false positives</td>
</tr>
<tr>
<td>Simple, clean, on-off technology</td>
<td>Process consistency</td>
<td>$ Savings</td>
</tr>
<tr>
<td>Greater flexibility</td>
<td>No carcinogens</td>
<td>Consistent quality</td>
</tr>
<tr>
<td>No expensive breathable packaging required</td>
<td>Ability to handle any shipment size</td>
<td>Environmentally friendly</td>
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<td></td>
<td>Ability to process mixed product loads</td>
<td>Time savings</td>
</tr>
<tr>
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<td>Packaging flexibility</td>
<td>Simplified scheduling</td>
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Source: EBSI.
Seafood & fresh water fish

- **Fin Fish**
  - Tuna, Mackerel
  - Eels, Sardines, Barracuda
  - Sea breams, Grouper

- **Crustaceans**
  - Shrimps, Lobster, Crab

- **Shell Fish**
  - (Clams, Mussels, Cuttlefish, Squid)
  - Ivory shell
  - Wreck

- **Fresh water fish**
  - Snake head
  - Catfish

- IQF
- Fresh/Chilled
- Frozen
- Breaded

Benefits of E-Beam Irradiation

- Destroys pathogenic microorganisms including E.coli, Salmonella and Vibrio vulnificus (flesh eating bacteria).
- Shelf life Extension
- Boost of Exports
Fruits

- Mango
- Guava
- Dates
- Citrus
- Persimmon
- Jojoba
- Apple
- Grapes
- Papaya

Benefits of E-Beam Irradiation

- Control of insects, fruit fly etc.
- Controls bacteria and molds
- Shelf life extension
- Boost of Exports
Benefits of E-Beam Irradiation

- Control of insects, fruit fly etc.
- Shelf life extension
- Inhibition of fast germination (Potatoes, Onions, Garlic, Shallot etc.)
- Boost of Exports
Meat & Poultry

Beef
Mutton
Chicken
Turkey etc.
Eggs

Benefits of E-Beam Irradiation

- Destroys harmful bacteria such as E.coli and Salmonella etc.
- Shelf life extension
- Boosts of Exports
Benefits of E-Beam Irradiation

- Controls insects infestation
- Reduces number of microorganism and pathogenetic microorganisms including E.coli and Salmonella
- Does not compromise on sensory attributes and wholesomeness of the food
- Boost of Exports
Benefits of E-Beam Irradiation

- Controls insect infestation
- Controls pathogenic bacteria & mold growth
- Extends shelf life
- Boost of Exports
Pharma Products

- Surgical gauze, dressing, lint cotton, eye pads
- Disposable surgical gloves
- Face mask, Surgical gown
- Disposable Syringes, Needles
- Infusion giving sets
- Suture/catguts
- Aluminium collapsible tubes
- Aluminium caps
- Sanitary Napkins
- Gynae pads, Nappies
- Catheters, Urine bags
- Urine containers, Cannula

Benefits of E-Beam Irradiation

- Destroys pathogenic bacteria
- Sterilization of materials
Pharma Products

- Empty eye drop vials/bottles
- Pharmaceutical raw material
- Electro Medical instruments
- Eye guards/Eye protector
- Safe Delivery Kits
- Petri dishes
- Mucus Airways
- Rubber Stopper, Al-Seals
- Dress Shell Rolls
- Surgical instruments

Benefits of E-Beam Irradiation

- Destroys pathogenic bacteria
- Sterilization of materials
Dry Fruits

Raisins (Kishmish)
Dry dates (Chuwara)
Walnuts
Pistachio
Pine Nuts
Almonds
Plums
Apricots

Benefits of E-Beam Irradiation

- Controls insects/pests
- Inhibits pathogenic bacteria & molds
- Extends shelf life

■ Whole Shelled
 ■ Unshelled
■ Mixed
Cereals & Pulses

- Rice
- Lentils (Dhals)
- Barley
- Wheat
- Oats
- Corn
- Millet

Benefits of E-Beam Irradiation

- Controls Insects/Pests
- Destroys harmful bacteria
- Inhibits germination
Benefits of E-Beam Irradiation

- Controls insects
- Controls germination
- Eliminates harmful bacteria
Animal & Poultry Feed

- Colostrum
- Whey Powder
- Whey protein
- Guar Korma
- Formulated Animal & Poultry feed

Benefits of E-Beam Irradiation

- Inhibits harmful bacteria such as E.coli & Salmonella
- Extends shelf life

Dry
Semi-dried
Pet Foods & Treats

Bird feed
Dog & Cat Feed
Pet Toys

Benefits of E-Beam Irradiation

- Destroys pathogenic bacteria such as E.coli and Salmonella
- Controls insect infestation

- Packed Products
- Non-Packed
Benefits of E-Beam Irradiation

- Sterilization of packaging materials
Benefits of E-Beam Irradiation

- Inhibits bacterial growth
- Extends Shelf life