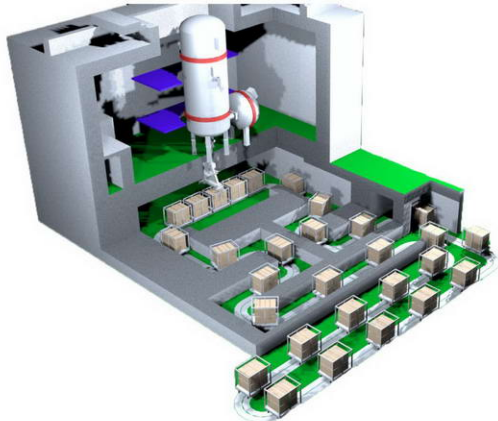


# **E-BEAM TECHNOLOGY**

**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.

**Disinfestations:** 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



# Advantages of E-Beam over Gamma



Feature	Benefit	Net Gain
<ul style="list-style-type: none"><li>■ Faster Turnaround</li><li>■ Flexibility</li></ul>	<ul style="list-style-type: none"><li>■ Reduced inventory</li><li>■ Quick dose changes</li><li>■ Custom tailored processing</li></ul>	<ul style="list-style-type: none"><li>■ \$ Savings</li><li>■ \$ Savings</li><li>■ Customer Satisfaction</li></ul>
<ul style="list-style-type: none"><li>■ Less material degradation</li></ul>	<ul style="list-style-type: none"><li>■ Reduced risk of product damage</li></ul>	<ul style="list-style-type: none"><li>■ Safer product</li><li>■ Easier qualification</li></ul>
<ul style="list-style-type: none"><li>■ Uniform, controlled dose</li></ul>	<ul style="list-style-type: none"><li>■ Precise dose delivery with no shielding from other products</li></ul>	<ul style="list-style-type: none"><li>■ Consistent quality with customized dosing</li></ul>
<ul style="list-style-type: none"><li>■ No radioactive source</li></ul>	<ul style="list-style-type: none"><li>■ No security, transportation, or disposal concerns</li><li>■ On/off technology</li></ul>	<ul style="list-style-type: none"><li>■ Environmentally friendly</li><li>■ Long term service stability</li><li>■ \$ Savings</li></ul>
<ul style="list-style-type: none"><li>■ No re-sourcing required</li></ul>	<ul style="list-style-type: none"><li>■ No radioactive cobalt resupply downtime</li></ul>	<ul style="list-style-type: none"><li>■ Uninterrupted processing capability</li></ul>

Source: EBSI.



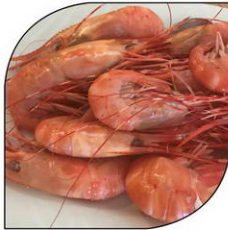
# Advantages of E-Beam over ETO



Feature	Benefit	Net Gain
<ul style="list-style-type: none"><li>■ Lower cost</li><li>■ No residuals</li></ul>	<ul style="list-style-type: none"><li>■ Lower price</li><li>■ Product immediately useable</li><li>■ Safer product</li><li>■ International acceptability</li><li>■ BI's not required</li></ul>	<ul style="list-style-type: none"><li>■ \$ Savings</li><li>■ Simplified inventory management</li><li>■ No OSHA concerns</li><li>■ No EPA/Environmental concerns</li><li>■ No false positives</li></ul>
<ul style="list-style-type: none"><li>■ Faster turnaround</li></ul>	<ul style="list-style-type: none"><li>■ Reduced inventory</li></ul>	<ul style="list-style-type: none"><li>■ \$ Savings</li></ul>
<ul style="list-style-type: none"><li>■ Simple, clean, on-off technology</li></ul>	<ul style="list-style-type: none"><li>■ Process consistency</li><li>■ No carcinogens</li></ul>	<ul style="list-style-type: none"><li>■ Consistent quality</li><li>■ Environmentally friendly</li></ul>
<ul style="list-style-type: none"><li>■ Greater flexibility</li></ul>	<ul style="list-style-type: none"><li>■ Ability to handle any shipment size</li><li>■ Ability to process mixed product loads</li></ul>	<ul style="list-style-type: none"><li>■ Time savings</li><li>■ Simplified scheduling</li></ul>
<ul style="list-style-type: none"><li>■ No expensive breathable packaging required</li></ul>	<ul style="list-style-type: none"><li>■ Packaging flexibility</li></ul>	<ul style="list-style-type: none"><li>■ \$ Savings</li></ul>

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**





**Mango**

**Guava**

**Dates**

**Citrus**

**Persimmon**

**Jojoba**

**Apple**

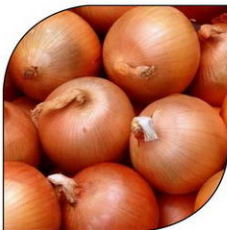
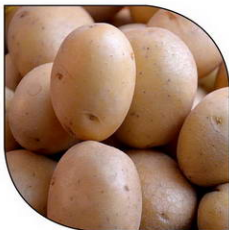
**Grapes**

**Papaya**

- **Fresh**
- **Dried**

## **Benefits of E-Beam Irradiation**

- **Control of insects, fruit fly etc.**
- **Controls bacteria and molds**
- **Shelf life extension**
- **Boost of Exports**



**Potato**

**Onion**

**Chilli**

**Okra**

**Garlic**

**Egg plant**

**Mushrooms**

**Shallots**

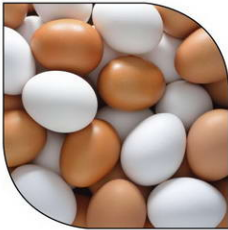
**Bitter gourd**

■ **Fresh**

■ **Dried**

## **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**



**Beef**  
**Mutton**  
**Chicken**  
**Turkey etc.**  
**Eggs**

- **Fresh/Chilled**
- **Frozen**
- **Processed**

## **Benefits of E-Beam Irradiation**

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



**Red chilli**

**Turmeric**



**Black pepper**

**Cloves**

**Coriander seeds**

**Fennel seeds**



**Star Anise**

**Mixed spices**

- Whole
- Ground

## Benefits of E-Beam Irradiation

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



**Bay leaves**

**Curry leaves**

**Coriander leaves**

**Dried flowers**

**Fenugreek leaves**

**Mint leaves**

**Rose hips**

**Rose petals**

- **Fresh**
- **Dried whole**
- **Ground**

## **Benefits of E-Beam Irradiation**

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





**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**





**Empty eye drop vials/bottles**

**Pharmaceutical raw material**

**Electro Medical instruments**

**Eye guards/Eye protector**

**Safe Delivery Kits**

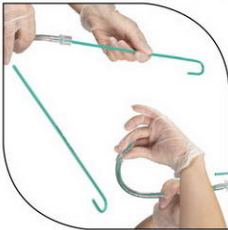
**Petri dishes**

**Mucus Airways**

**Rubber Stopper, Al-Seals**

**Dress Shell Rolls**

**Surgical instruments**



## **Benefits of E-Beam Irradiation**

- **Destroys pathogenic bacteria**
- **Sterilization of materials**



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

- **Whole Shelled**
- **Unshelled**
- **Mixed**

## **Benefits of E-Beam Irradiation**

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



**Rice**

**Lentils (Dhals)**

**Barley**

**Wheat**

**Oats**

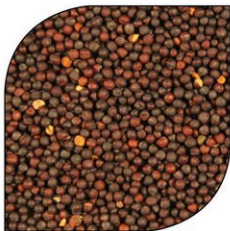
**Corn**

**Millet**

- **Whole**
- **Ground**
- **Mixed Products**

## **Benefits of E-Beam Irradiation**

- **Controls Insects/Pests**
- **Destroys harmful bacteria**
- **Inhibits germination**



**Millet**

**Canola**



**Soybean**

**Alfalfa Seeds**

**Guar Seed**



**Castor Seeds**

**Flax Seeds**

**Sunflower Seeds**

## **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**

- **Dry**
- **Semi-dried**

## **Benefits of E-Beam Irradiation**

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





**Bird feed**  
**Dog & Cat Feed**  
**Pet Toys**



- **Packed Products**
- **Non-Packed**

## **Benefits of E-Beam Irradiation**

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



**Plastic Containers/bottles**

**Dairy Packaging**

**Pet bottles**



## **Benefits of E-Beam Irradiation**

- **Sterilization of packaging materials**



**Lipsticks**

**Eye shades**

**Mascaras**

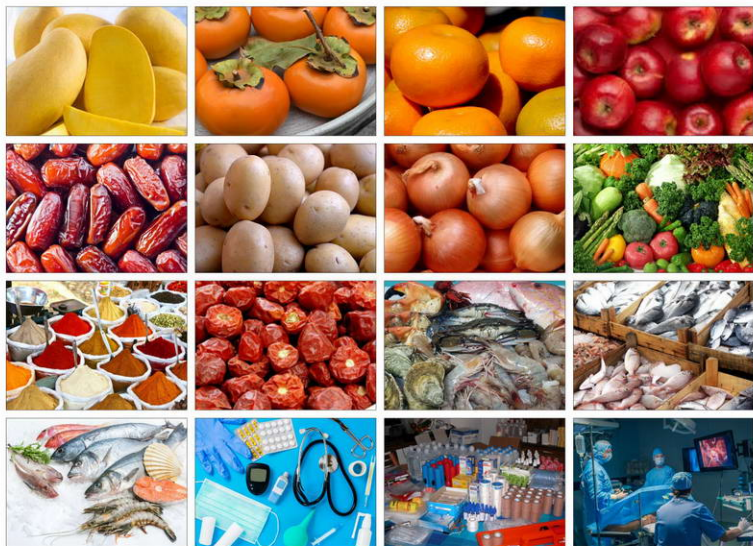
**Creams**

**Raw Talc**



## **Benefits of E-Beam Irradiation**

- **Inhibits bacterial growth**
- **Extends Shelf life**



## **Pak Electron Beam Irradiation (Pvt.) Ltd.**

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