



CUSTOMER FOCUSED  
QUALITY ASSURED



sterilization

lab services

material modification

contamination control

[www.isotron.com](http://www.isotron.com)

## Common terms and definitions

### Gamma

- Source activity - the amount of radioactive material present in the source. This is expressed in Becquerels (Bq). One Bq is one disintegration per second. The unit Curie (Ci) is also commonly used, where one Curie =  $3.7 \times 10^{10}$  Bq. During the decay process atoms of Cobalt 60 are transformed into atoms of stable Nickel 60.
- Absorbed dose - the amount of radiation absorbed by the product measured in kiloGrays, where one Gray = one Joule per kilogram product. Historically the unit was the rad derived from "radiation absorbed dose". One Gray = 100 rads
- Dose mapping - placing of dosimeters throughout the unit to obtain an indication of dose-distribution.
- Routine dosimetry - the placement of a dosimeter at the reference points from which the minimum and maximum dose can be calculated once dose mapping has been performed.
- Dose distribution - the ratio between the minimum dose and the maximum irradiation dose in a product. Typically expressed as a range e.g. 25 - 45 kGy
- Cobalt 60 - an isotope of Cobalt 59 with a half life of 5.3 years
- Half-life - The average time it takes for one half of the particles in a sample of radioactive material to decay.
- Sterility
- Sterility assurance level (SAL) - the ratio between the total number of products and a contaminated product. For example: an SAL of  $10^{-4}$  is one contaminated product in 10,000
- D-10 value - the dose in kGy needed for a 90% reduction in the number of the microorganisms. (10-log reduction).
- Overall density - the weight of the treated unit divided by the volume of the unit expressed as gms per cm<sup>3</sup>

### E-beam

- Cross-linking  
The setting up of chemical links between the molecular chain of polymers.
- Electron volt (eV)  
In industrial electron beam processing, the amount of energy used to describe radiation is the electron-volt, where one eV is the kinetic energy imparted to a single charge falling through a potential of one volt.
- Free radicals  
An electrically neutral molecule with an unpaired electron in the outer orbit. These species are highly reactive.
- Intensity  
The number of electrons per second available at the product (target) determines the intensity of the beam. The unit of measure is the ampere (A).
- Power  
The power of the beam is the product of the intensity and energy. The unit of power, the Watt, is equal to one Joule per second.