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We work in the Centre of Applied Nuclear Physics, before Institute of Nuclear Physics, Tirana, Albania. Now the Centre belongs to the Faculty of Natural Sciences, University of Tirana, Albania.

About the radiation resources, the situation at the Centre of Applied Nuclear Physics is as the following: it has an electron accelerator, Van de Graf type 2 MeV / 200 μ A, produced in 1964, which for some years it is out of work.

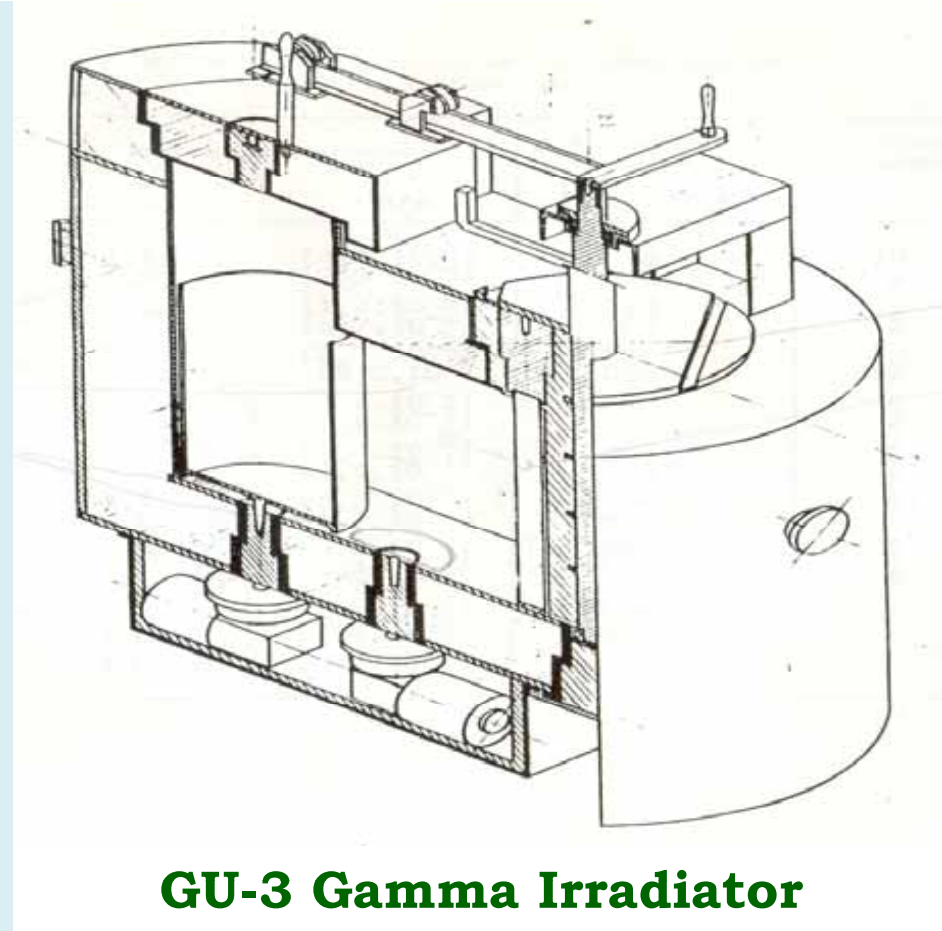
The accelerator is used mainly for modification of plastic materials.



Electron accelerator

The other radiation source is the GU-3 gamma irradiator with Cs¹³⁷, installed in 1986 in the centre.

Taking into consideration our possibilities, we have made every effort for using of our gamma radiation source.



GU-3 Gamma Irradiator

APPLICATION OF GAMMA IRRADIATOR

Sterilization of health care products

Genetic improvement and creation of new variety of plant

Reduction of total microbial load of animal feed

To carry out the above mentioned activities the Centre of Applied Nuclear Physics has collaboration with different institutions.

**CENTRE OF APPLIED
NUCLEAR PHYSICS**

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graph LR; A[CENTRE OF APPLIED NUCLEAR PHYSICS] --> B[Institute of Public Health]; A --> C[Faculty of Veterinary and Medicine]; A --> D[Institute of Food Safety and Veterinary]; A --> E[Faculty of Natural Sciences, Department of Biotechnology];
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Institute of Public Health

Faculty of Veterinary and Medicine

Institute of Food Safety and Veterinary

**Faculty of Natural Sciences, Department of
Biotechnology**

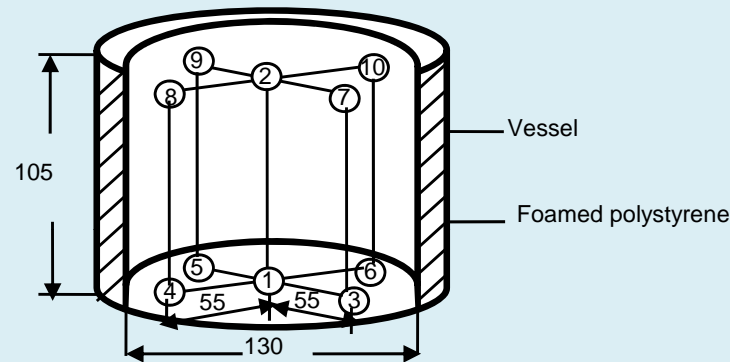
For measuring the dose and its distribution the ECB dosimeter is used as the routine dosimeter.

The ionization chamber (approximately with the same volume of the dosimetric solution in the ECB dosimeter) is used as the standard dosimeter. The calibration procedure is made every year. The ECB dosimeters are irradiated with different doses beginning from dose about 3 kGy till to 30 kGy and the response of the irradiated dosimeters is measured by the oscillogrator OK 302/2.

The uncertainty of the oscillometric method used is $\leq 6\%$.

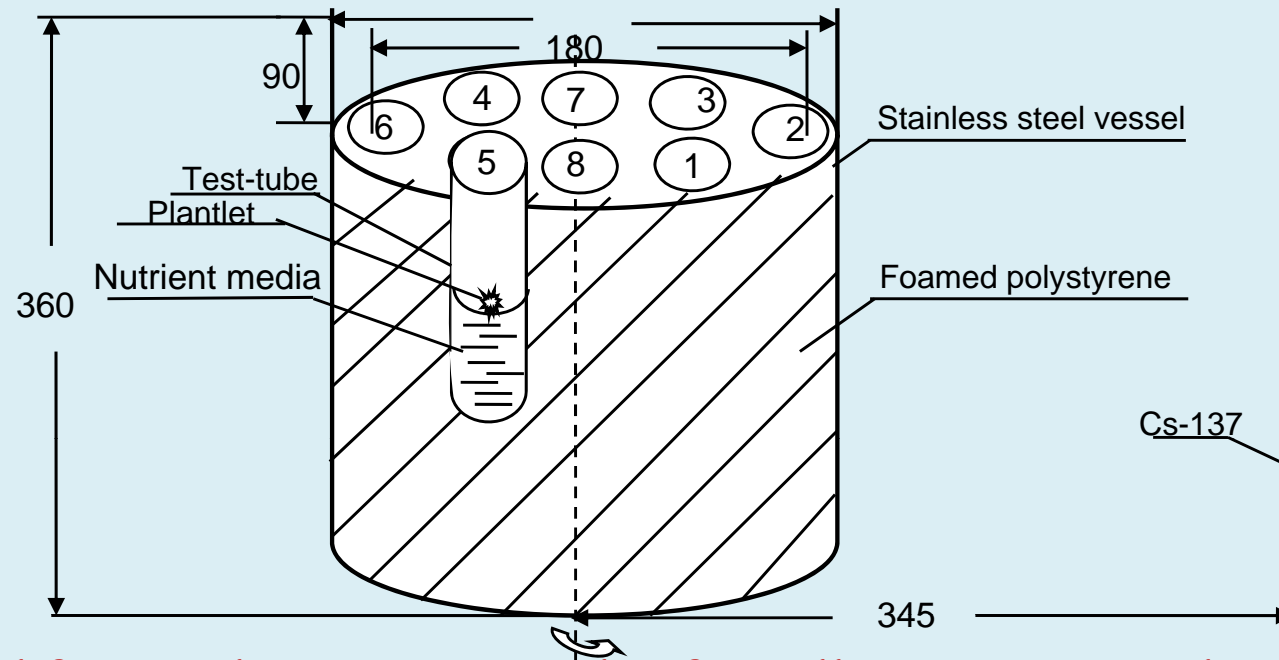
For dose distribution measurement, the ECB dosimeters are used, by inserting them to the material to be irradiated.

For irradiation of the materials two vessels (from stainless steel) with volume respectively 14 l and 5.7 l are used.

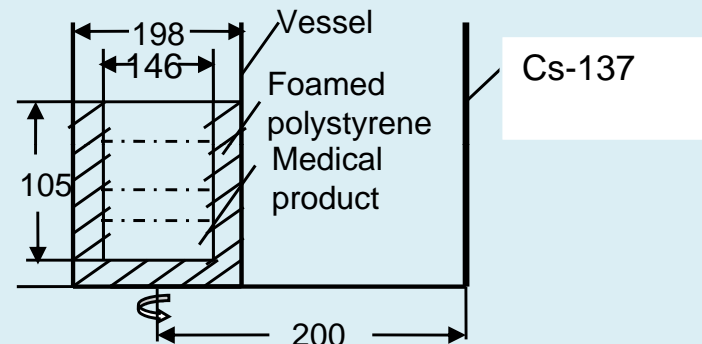


The position of ECB dosimeters into the vessel

For irradiation of materials, different radiation techniques are used. Those are based on the rotation of the vessel with the material inside it. Such radiation process provides good dose uniformity.



Technique used for irradiation materials of small quantities and small dimensions (Ramonda Serbica plantlets and its seeds, sunflowers seeds etc).



Radiation technique of medical products, animal feed, bulb of tulip, wheat etc.

Using the above irradiation technique different health care products and different food and feed samples are irradiated in the GU-3 gamma irradiator. All the materials, before irradiation are packaged in sealed plastic bags.

Taking into consideration the results achieved in the sterilization of health care products and reduction of total microbial load in food and feed samples, during last year, in cooperation with Archive of State we have begin an experiment. It consist in the using of gamma irradiation in the books with mould papers. It was seen that the dose 5 kGy kill the mould. We will continue this experiment using different doses, to get the useful interval (D_{min} , D_{max}).

The experience that we will gain during this course, will give us the possibilities to irradiate some others cultural heritage artefacts, with small volume for preservation.

