

H E A L T H

Technologies for Better Quality of Life

BLOOD IRRADIATOR [BI-2000]

Irradiation of blood & blood products by gamma rays is a proven and safe method to inhibit T-Lymphocyte proliferation and eliminate the risk of post transfusion graft-versus-host-disease (T-GVHD). Gamma irradiation of cellular blood components is the best current technology to reduce the risk of T-GVHD to the recipients as confirmed by research, and therefore, is being widely practiced world over in hospitals and blood banks as a life saving approach to this problem.



Blood Irradiator-2000 (BI-2000)

Blood is usually irradiated in standard blood bags in dedicated blood irradiators using Cobalt-60 or Cesium-137 radioactive source. The usual recommended radiation doses are 25 Gray to 35 Gray (1 Gray = 100 rad) for this purpose.

BRIT has designed and developed a dedicated blood irradiator known as Blood Irradiator-2000 (BI-2000). It is a self-shielded, compact and versatile gamma irradiator which can house Cobalt-60 source up to 25 TBq (675 Curies). It provides a dose rate of about 11 Gray/minute approximately inside the sample chamber. It is incorporated with a sample rotating mechanism to obtain better uniformity of dose to the products. The control system is a PLC (Programmable Logic Controller) based with touch sensitive color screen using

user-friendly software and a printer for data recording.

The unit can be installed in a room without any additional shielding. Its design conforms to all relevant national and international standards and safety codes. It meets the requirement of Type B(U) package for transportation.

Features

- *Safe & self shielded* : No additional shielding is required. The radiation field on the external surface of the unit is much below the permissible level.
- *Dose uniformity* : Sample rotation mechanism and stationary source pencils symmetrically placed in a cylindrical cage ensure good uniformity of radiation field within 25% variation or better.
- *Control system* : PLC based control system with touch sensitive colour screen having user friendly software and printer for data recording.
- *Computerised calculations of dose* and termination of irradiation based on time as well as dose modes with Cobalt-60 source decay correction.
- *Sensing & display* of irradiation temperature on the panel.
- *Sample chamber door inter-lock* for safety operation.
- *Manual control of irradiation temperature* inside sample chamber.
- *Design* conforms to codes of Atomic Energy Regulatory Board (AERB), India, as well as American National Standards – ANSI – N433.1 – 1977 for safe design and use of self contained dry source storage gamma irradiator (Category-I).
- *Safety assurance* : The unit is Type B(U) approved by the Atomic Energy Regulatory Board (AERB), India, for safety in transport or radioactive material as per relevant national and international safety standards.
- *Source Replenishment and Servicing* : BRIT undertakes servicing and source replenishment whenever required.
- *Source Disposal* : BRIT also takes up source disposal as and when required.
- *Refrigerator* is provided along with unit for storing blood bags at low temperature.

The first unit of BI-2000 has been supplied to the Kidwai Memorial Institute of Oncology, Bangalore where it has been in operation since August 2001. The second unit has been in operation at the Gujarat Cancer & Research Institute, Ahmedabad since October 2001. A few more units are going to be installed shortly at various places in India.

Specifications :

Maximum Co-60 source capacity: 25 TBq (675 Ci)
Dose rate at maximum capacity : ~11Gy/minute
Shielding material : Lead & stainless steel
Weight of the unit : ~2,600 Kgs.
Size of the unit : 112 cm (l) x 95 cm (w) x 171 cm (ht)
Minimum room dimensions : 3 mtr. x 3 mtr. x

Sample Chamber**Rotating Chamber**

Volume	3 litres.	2 litres.
Size	13 cm (dia) x 21.7 cm (ht)	12 cm (dia) x 17.9 cm (ht)
Speed	---	60 RPM

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