

BIOBEAM

Optimum Homogeneity for Blood Irradiation

BIOBEAM GM

gamma irradiation devices are fully protected devices for comfortable, effective and precise irradiation in transfusion medicine and research.

High performance: large beaker volume and a homogenous dose distribution.

Maximum Throughput

The extra-high radiation volume enables irradiation of up to 20 blood bags in one single cycle and the use of a wide variety of special containers. With the BIOBEAM GM 8000, two positions are available for the beakers.

The position for smaller beakers are closer to the source and receive a higher dose rate. Therefore the irradiation period can be halved, when irradiating smaller volumes.

Optimum Homogeneity

The oscillation of the source provides an optimum dose distribution within the full irradiation volume. A dose difference of less than 10 % can be realised by using special irradiation inserts.

User Friendly

The entire BIOBEAM GM operation is carried out easily using a touchscreen. This enables the direct selection of irradiation programs by the simplest possible means.

At the same time, BIOBEAM GM identifies the beaker and checks the correspondence with the selected irradiation program. The documentation software enables the customer to follow all information related to the irradiation process.



Radiation Surveillance

BIOBEAM GM blood irradiation systems are fully protected devices with less than 3 $\mu\text{Sv/h}$ surface dose rate. This means that no additional radiation protection measures are necessary. Also there is no radiation surveillance required for staff, e.g. your personnel has not to be equipped with dosimeters.

Highest Safety

The safety functions of the BIOBEAM GM guarantee highest safety, e.g. the monitoring system, which controls the irradiation period, the oscillation of the source, the rotation of the irradiation load, the position of the rotary shielding and the irradiation beaker closure.

Flexible Expansion

BIOBEAM GM provides a variety of optional expansions to match the customer's specific needs:

- Inserts for specific irradiation tasks
- PC with Software BB GM PRO
- Barcode reader and printer for comfortable irradiation documentation
- Integration of BIOBEAM GM in a blood bank software via an optional network connection



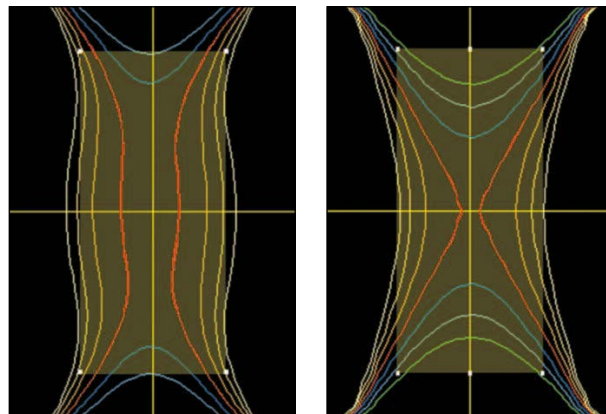
Eckert & Ziegler

Gamma Service Medical

Safety Features

- Key switch
- Irradiation cycle in progress continues for up to 30 min, in case of power failure
- Removal of the irradiation load also in case of system failure
- Interdependent locking of loading hatch and irradiation chamber
- Monitoring and control of irradiation parameters
- Self-check of the irradiation unit before and during the irradiation procedure
- The BIOBEAM GM computer system continually saves all data relevant to the irradiation process

Optimum Dose Distribution



BIOBEAM GM dose distribution

Typical dose distribution of other devices

Technical Data

Irradiation beakers

| | BIOBEAM GM 2000 | BIOBEAM GM 3000 | BIOBEAM GM 8000 | | |
|--|---------------------|-------------------|-------------------|---------------------|---------------------|
| Volume | 3.2 l | 3.2 l | 1.3 l | 5.1 l | 7.5 l |
| Diameter | 140 mm | 140 mm | 94 mm | 170 mm | 190 mm |
| Height | 220 mm | 220 mm | 265 mm | | |
| Dose rate at center of beaker (water equivalent) | 2.5 Gy/min ± 25% | 5 Gy/min ± 25% | 5 Gy/min ± 25% | 2.8 Gy/min ± 25% | 2.6 Gy/min ± 25% |
| Rotation speed | unrestricted | unrestricted | unrestricted | | |

Source

| | | | |
|--------------------------|----------------|------------------------------|----------------|
| Radionuclide | Cs137 | Cs137 | Cs137 |
| Number of sources | 1 | 1 | 1 |
| Activity | 44.4 TBq ± 20% | 81.4 TBq ± 20% | 81.4 TBq ± 20% |
| Special form certificate | yes | yes | yes |
| Authorisation | | CE, CFDA, SFDA, KFDA, ANVISA | |

Irradiation unit

| | | | |
|--------------------------------|------------------------------|------------------------------|------------------------------|
| External dimension (W x D x H) | 660 x 670 x 1,645 mm | 660 x 670 x 1,645 mm | 810 x 810 x 1,740 mm |
| Weight | 2,200 kg | 2,200 kg | 2,900 kg |
| Recommended room size | min. 2 x 2 m | min. 2 x 2 m | min. 2 x 2 m |
| Electrical supply | 90–264 V; 47–63 Hz | 90–264 V; 47–63 Hz | 90–264 V; 47–63 Hz |
| Power consumption | 110 VA | 110 VA | 110 VA |
| Room temperature | + 15°C to + 35°C | + 15°C to + 35°C | + 15°C to + 35°C |
| Surface dose rate | < 3 µSv/h up to 54 TBq Cs137 | < 5 µSv/h up to 98 TBq Cs137 | < 3 µSv/h up to 98 TBq Cs137 |