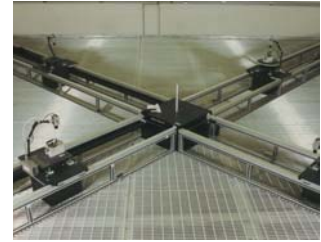


Hopewell Designs, Inc.

AUTOMATED IRRADIATOR SYSTEMS



- Automated Irradiator Control Software
- Gamma Beam Irradiators
- Box Calibrators
- Panoramic Irradiators
- Low Scatter Irradiators
- Well Irradiators
- X-Ray Irradiators
- Ancillary Equipment
- Radiation Shielding



Hopewell Designs, Inc. offers a complete line of irradiators and automated irradiator control software for calibrating radiation survey meters. Models range from a manual calibrator with 1 source to a fully automated irradiator with eight sources and multiple positioning tracks. Over 100 irradiator systems have been supplied to instrument calibration and dosimetry laboratories throughout the world.

Our designs are the result of listening to our customers. Comments and recommendations have been incorporated into our irradiators to make them more precise, easier to use, and more efficient. Our automated software gives customers a level of control that assures quick, accurate calibrations.

Hopewell Designs, Inc. is committed to supplying the best possible service to our customers. We do this by partnering with our customers - from design to installation to ongoing service. We offer comprehensive solutions to calibration and dosimetry programs - for irradiators, software control, radiation shielding, and calibration services.

At Hopewell Designs, we do not see the sale and delivery of an irradiator as the end of the project, but rather the beginning of a partnership. We maintain constant dialog with our customers through formal and informal means. We offer ongoing support, software upgrades, and training. From these relationships, we craft new solutions to help meet our customers stringent needs.

MODEL G10 - GAMMA BEAM IRRADIATOR

The Model G10 Gamma Beam Irradiator provides a horizontal radiation beam for calibrating radiation detection instruments and irradiating personnel dosimetry. This irradiator is available with one or two radioactive sources in a wide range of activities. The system comes complete with radiation sources, shielded enclosure, beam collimator, safety interlocks, and control panel. Optional equipment includes attenuators, positioning tracks, and automated controllers. The model G10 consists of six sub-models based on the size and quantity of Cs-137 radioactive sources.



- **Single or Dual Source Models**
- **Cesium 137 Sources - 10 mCi to 2,200 Ci**
- **Fail-Safe Design**
- **Manual or Fully-Automated Operation**
- **Precision Linear Positioning Track**
- **0 - 8000X Attenuator Set**

RADIOACTIVE SOURCES

The ¹³⁷Cesium sources are doubly encapsulated, hermetically sealed, special form sources. Standard source sizes are:

10 mCi	1 Ci	30 Ci	450 Ci
50 mCi	5 Ci	50 Ci	1200 Ci
100 mCi	10 Ci	100 Ci	2200 Ci
500 mCi	20 Ci	200 Ci	

A stainless steel and tungsten rod houses the source(s) in the irradiator. Tungsten above and below the source limits radiation along the axis of the source rod. When two sources are used, an additional section of tungsten separates the sources to minimize cross-talk. The source is moved to shielded and exposed position by a pneumatic air cylinder with attached sensors that indicate source position. In the shielded position, the source is shielded on all sides with lead and tungsten.

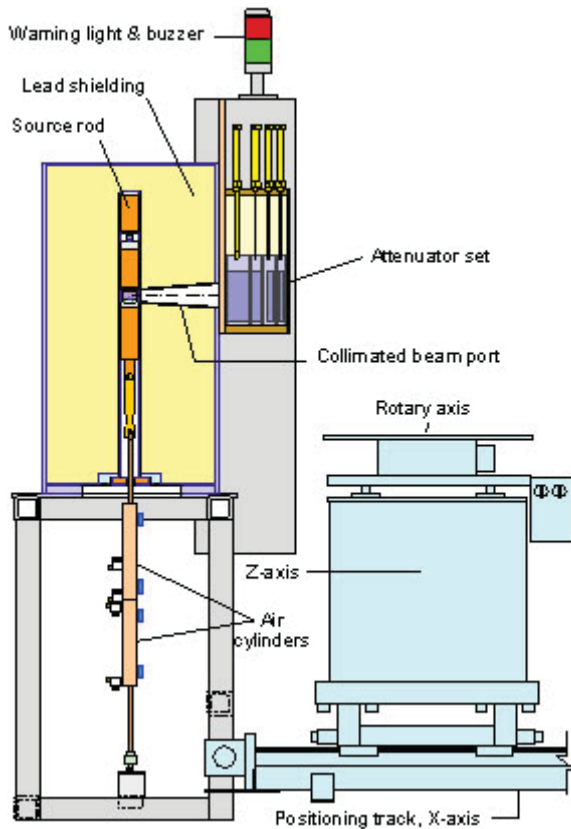
The dual source irradiator uses a two stage air cylinder to move first, the low activity source to the exposed position. When the second stage is actuated, the second, higher activity source is exposed and the smaller source is moved above the beam port to the shielded position.

SHIELDED ENCLOSURE

The shield is a steel-encased lead cylinder with the beam centerline at 1 meter above the floor. Lead surrounds the tube through which the source travels, providing sufficient shielding to limit the radiation level to < 5 mR/h at 12" from the surface of the shield when sources are in the shielded position. Overall dimensions are 30" wide x 18" deep x 70" tall (65" tall for single source models). A rectangular

MODELS FOR THE G10 SERIES OF GAMMA BEAM IRRADIATOR

Model Number	No. of Sources	Maximum Activity	Height (Inches)	Diameter (Inches)	Weight (Lbs.)
G10-1-12	1	12 Ci	15	10	500
G10-2-12	2	12 Ci	24	10	800
G10-1-360	1	360 Ci	17	12	800
G10-2-360	2	360 Ci	27	12	1200
G10-1-2600	1	2600 Ci	19	14	1200
G10-2-2600	2	2600 Ci	28	14	1800



Cross-Section of Dual Source Gamma Beam Irradiator with Attenuators and Positioning Track

tungsten beam collimator, which defines and limits the extent of the useful beam, confines the full strength beam to a maximum solid angle of 30°.

SAFETY SYSTEM

The irradiator system incorporates many features to make it a safe system to operate. “Fail Safe” design constraints have been applied to all components that involve source exposure. The safety interlock system must be fully satisfied before an exposure can occur. Status panels show radiation conditions at a glance. The entire system has been designed to meet or exceed guidelines and regulations found in ANSI Standards N43.3 and NCRP 88.



Electronic Control Panel



Computer Control Panel

CONTROL PANEL

The G10 is available with either a computer controller or electronic control panel. Computer control offers: exposure rate calculation, one button set up of irradiator, control of positioning track, and automatic irradiator calibration.

The electronic control panel has a front panel with LCD display that shows: exposure time, expose and return pushbuttons, indicator lights, an emergency off pushbutton, and a keyed power switch. A keypad provides data entry and exposure time can be set up to 900,000 seconds.

ANCILLARY EQUIPMENT

Positioning Track: Up to 4 axes and 10m lengths

Collimators: Other sizes available.

Attenuators: A set of 4 lead attenuators (X2, X4, X10, and X100) provide 16 different levels of attenuation from 0 to X8000.



0 - 8000X Attenuator Set