

# The RS 1800 Biological Irradiator



**The Industry Standard for  
Biological Research for  
Tissue and Cell Research**

**The Most Powerful Dedicated  
Cell Irradiator Available**

#### **X-Ray Designed for Life Science Applications**

Rad Source irradiators are designed for life science and provide the scientist with the research solutions and flexibility for many advantageous configurations with superior dose uniformity and dose rates.

#### **Ensured Uniformity**

Patented RADPlus™ research solutions are designed to ensure dose uniformity of up to 95% or higher.

#### **20+ Years of Proven Service and Support**

With more than 1000 irradiator installs in renowned hospitals, universities, pharmaceutical, government and life science institutions world-wide, Rad Source is a proven and reliable x-ray solutions manufacturer with unmatched, trusted services since 1997.

cell

# The RS 1800 Biological Irradiator

## X-Ray Designed for Life Science™

The RS 1800 Q Biological Irradiator is used for cancer, immunology, stem cell and other cell biology research applications for primary cell and tissue culture irradiation.

The system is designed around the patented Quastar™ x-ray technology platform built specifically for life science applications.

### **RADPlus™ Solutions - Engineered for Life Science**

- Patented material developed to increase dose rate and optimize dose uniformity.

### **Multi-level Chamber Exposure System with Guides**

- 3-level exposure chamber with manually adjustable shelves, which allows for flexibility in the placement of the specimen.
- 3 concentric circles (radiation field guides) for the placement of samples.

### **Instrument Portability**

- Mounted on sturdy castor wheels for convenient portability, allowing for flexible placement and improved workflow efficiency.

### **Direct Replacement for Nuclear Source Irradiators**

- Considered by FDA to be “substantially equivalent” to Cesium-137 gamma irradiators for the irradiation of blood and blood products.

### **No Radioactive Source – No Ongoing Regulatory Hassles**

- No Nuclear Regulatory Commission (NRC) License required.
- No nuclear disposal requirements.
- No additional security requirements.
- No additional safety equipment for laboratory staff.
- Meets safety requirements specified in Fed. Reg. 21 CFR 1020.40.

Disclaimer: Regulations subject to change. Check with local radiation safety experts to confirm requirements.



# Oncology Research

Cancer researchers utilize our patented x-ray irradiation technology to assess the effects of radiation on different types of cancer cells in laboratory experiments, enabling them to more accurately predict the outcomes of radiation therapy in cancer patients.

Cancer cells are normal cells that have suffered genetic mutations in their DNA that cause them to multiply uncontrollably and escape death. Cancer cells display several “hallmark” behaviors that are characteristic of cells from all types of cancer, but individual types of cancer differ greatly in other behaviors, particularly in their response to radiation.

It is critical for cancer researchers to evaluate the effects of radiation on cancer cells in the laboratory. Doing so will lead to safer and more effective treatments for human cancer patients undergoing radiation therapy in the hospital or clinic.

Our patented x-ray irradiation technology is the preferred method to simulate radiation therapy in the laboratory. By using our technology, cancer researchers can perform experiments that show how cancer cells gain resistance to radiation and other experiments that evaluate the collective effect of new drugs or doses in combination with radiation therapy.

## Development of Specialized Cell Models

The RS 1800 can be used for cell arrestment in the development of specialized cell models for the study of antibodies, antigens, apoptosis and cell proliferation in a wide range of cell biology research.

### Feeder Cells

Researchers use our x-ray technology for feeder cell arrestment. Growth-arrested feeder cells provide extracellular secretions that help promote cell proliferation. Feeder cells can be used in oncology research to promote cancer cell growth for animal studies, for research on cell-based therapies and several other such applications.

### Hybridoma Cells

Our x-ray technology can be used in the development of Hybridoma cells. These cells are created by fusing B cells (type of white blood cells) and myeloma cells to produce specific antibodies, which can be used in the prevention, diagnosis and treatment of specific diseases. Hybridomas are produced by injecting target antigen into a mouse to invoke an immune response, harvesting B cells from the mouse, and fusing it with myeloma cells. The hybrid cell lines are then irradiated to stop growth and screened for those that produce the preferred antibodies.

### Apoptosis

Irradiation may be used in the study of the mechanism that causes apoptosis or cell death.



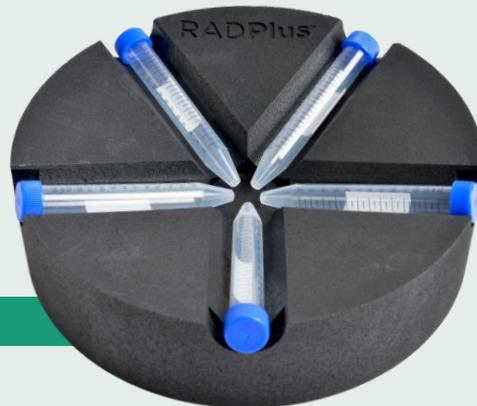
# RadPlus™ Research Solutions

RadPlus patented research solutions were developed to ensure superior dose uniformity of up to 95% or higher. The patented RadPlus material aids in uniform dosing and allows for higher dose rates. For more details on RADPlus Research Tools, please refer to the product sheets on the RS 1800 Series webpage.

## RADPlus™ Vial Holder

( RS#: 1402270 )

- Provides consistent and uniform vial dosing.
- Inclination angle serves to better position the target in the radiation field for optimal dosing.
- Compatible with vials, sizes 2 mL - 50 mL
- Multiple size vials can be used simultaneously.
- Place on the Aluminum shelf on the floor of chamber and use the outer ring to position in the center of the field.
- Dimensions: Diameter: 10"; Height: 2.5"



Solution	Dose Rate (Gy/min)	Flatness
RADPlus Vial Holder (2 kW)	6.0	95.0% +
RADPlus Vial Holder (4 kW)	12.0	95.0% +



## RADPlus™ Well Plate Holder

( RS#: 1402273 )

- Compatible with 24 & 96 well plates.
- Well Plate Holder can be placed on the Aluminum Shelf or the RADPlus Shelf. For higher dose rates with comparable flatness, use the RADPlus Shelf.
- The Well Plate Holder can be placed on the floor and shelf levels 1 or 2.
- Use corner markings on Aluminum shelf and RADPlus Shelf to correctly position the Well Plate Holder
- Dimensions: 8.00" x 6.00" x 1.75"

Chamber Location	Dose Rate (Gy/min)	Flatness
	2 kW / 4 kW	2 kW / 4 kW
Shelf 2	16.0 / 32.0	45% / 45%
Shelf 1	10.0 / 20.0	75% / 75%
Floor	5.0 / 10.0	85% / 85%

## RADPlus™ Petri Dish Holder

( RS#: 1402272 )

- Holds (3) standard size petri dishes and up to 14 smaller sized petri dishes.
  - 100mm x 15mm (3 plates)
  - 60 mm x 15mm (6 plates)
  - 35 mm x 10mm (14 plates)
- Place on the Aluminum shelf on the floor of the chamber
- Use the outer ring on the Aluminum shelf to position the Petri Dish Holder exactly in the center.



Solution	Dose Rate (Gy/min)	Flatness
Petri Dish Holder (2 kW)	5.0	85% +
Petri Dish Holder (4 kW)	10.0	85% +

# RadPlus™ Research Solutions (Continued)

RadPlus patented research solutions were developed to ensure superior dose uniformity of up to 95% or higher. The patented RadPlus material aids in uniform dosing and allows for higher dose rates. For more details on RADPlus Research Tools, please refer to the product sheets on the RS 1800 Series webpage.

## RADPlus™ Shelf

( RS#: 1404471 )

- Functions as a placeholder for lab components such as well plates and petri dishes that can be placed directly on the shelf. Multiple sizes can be used simultaneously.
- The well plate holder can be placed on the shelf as well. Markings on the four corners, outside the F ring should be used to align the well plate holder.
- Components need to be placed within the ring that corresponds to the shelf number in order to receive optimal dosing.
- Dimensions: 10.75" x 13.4" x 1.5".



Solution	Dose Rate (Gy/min)	Flatness
Shelf 2	55.0 / 110.0	75% / 75%
Shelf 1	15.0 / 30.0	75% / 75%
Floor	7.0 / 14.0	75% / 75%



## RADPlus™ Vial Rotator

( RS#: 1409656 )

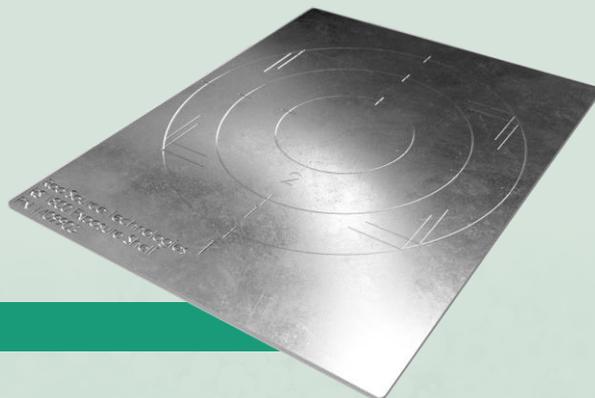
- Provides consistent and uniform vial dosing for eight 15 mL vials.
- Vial Rotator's inclination angle provides higher dose rates for 15 mL vials, and a DUR comparable to the Vial Holder.
- The rotator motor mechanism allows the vials to rotate for better dose uniformity across all vials.
- Dry ice can be placed within the center cup for continual freezing of samples.

Chamber Location	Dose Rate (Gy/min) 2kW / 4 kW	Flatness 2 kW / 4 kW
RADPlus Vial Rotator (2kW)	32.5	1.45
RADPlus Vial Rotator (4kW)	65.0	1.45

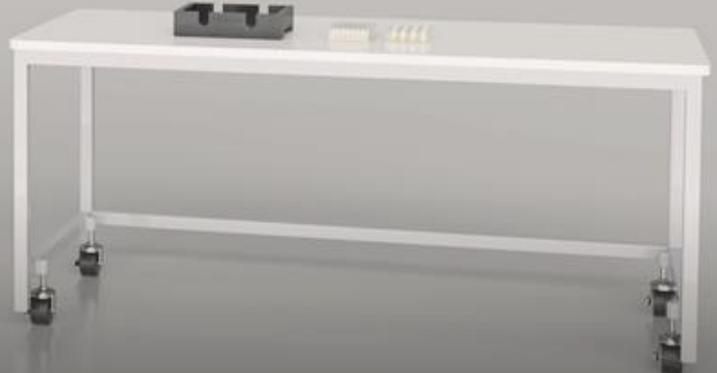
## Aluminum Shelf

( RS#: 1409903 )

- Functions as placeholder for lab components such as well plates and petri dishes that can be placed directly on the shelf. Multiple sizes can be used simultaneously.
- Can be placed on the floor or any of the 2 shelf levels, which offers a wide range of dose rates from top to bottom.
- Components need to be placed within the ring that corresponds to the shelf number in order to receive optimal and uniform dosing.
- Dimensions: 10.760" x 13.360" x 0.125"



Solution	Dose Rate (Gy/min)	Flatness
Shelf 2	20.0 / 40.0	75% / 75%
Shelf 1	8.0 / 16.0	75% / 75%
Floor	4.0 / 8.0	75% / 75%



## RS 1800•Q SPECIFICATIONS

### POWER

- 2000 W

### EQUIPMENT DIMENSIONS

- 30.0"W x 36.0"D x 64.0"H | 76.2 cm x 91.4 cm x 162.6 cm
- 1250 lb. | 567 kg

### ELECTRICAL REQUIREMENTS

- Power: 208/240 VAC, 1-phase, 50/60Hz, 30A, True Earth Ground

- Instrument Wiring:  
10 AWG L1, L2/N

### DOSE RATE (Gy/min) and FLATNESS/DUR SUMMARY

#### Dose Rate and Flatness/DUR Range for RADPlus Solutions

- |                             |                                     |
|-----------------------------|-------------------------------------|
| • RADPlus Vial Holder       | 6 Gy/min. - Flatness: 95%+          |
| • RADPlus Shelf             | 7 - 55 Gy/min. - Flatness: 75%      |
| • RADPlus Well Plate Holder | 5 - 16 Gy/min. - Flatness: 45 - 85% |
| • RADPlus Petri Dish        | 5 Gy/min. - Flatness: 85%+          |
| • RADPlus Vial Rotator      | 32.5 Gy/min. - DUR: 1.45            |

## RS 1800•Q4 SPECIFICATIONS

### POWER

- 4000 W

### EQUIPMENT DIMENSIONS

- 30.0"W x 36.0"D x 64.0"H | 76.2 cm x 91.4 cm x 162.6 cm
- 1350 lb. | 612 kg

### ELECTRICAL REQUIREMENTS

- Power: 208/240 VAC, 1-phase, 50/60Hz, 40A, True Earth Ground

- Instrument Wiring:  
8 AWG L1, L2/N

### DOSE RATE (Gy/min) and FLATNESS/DUR SUMMARY

#### Dose Rate and Flatness/DUR Range for RADPlus Solutions

- |                             |                                      |
|-----------------------------|--------------------------------------|
| • RADPlus Vial Holder       | 12 Gy/min. - Flatness: 95%+          |
| • RADPlus Shelf             | 14 - 110 Gy/min. - Flatness: 75%     |
| • RADPlus Well Plate Holder | 10 - 32 Gy/min. - Flatness: 45 - 85% |
| • RADPlus Petri Dish        | 10 Gy/min. - Flatness: 85%+          |
| • RADPlus Vial Rotator      | 65 Gy/min. - DUR: 1.45               |

## X-Ray Designed for Life Science™

Rad Source is a global leader in developing x-ray solutions for life science. Our mission is to develop innovative x-ray technologies that enable our customers to improve the world through life science research and life saving innovation. Whether our customers are doing cell or cancer research, solving life's most challenging issues or preventing the spread of infectious diseases, we are here to support them. Our global network of employees and partners deliver an unrivaled combination of the world's most innovative x-ray-based life science solutions and a highly trained and responsive global service and support footprint.

