

RA

## Технические характеристики

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# Radiation Monitoring

## Radiation Survey Meter, Monitor 4

General purpose, low cost, analogue meter for detecting Alpha, Beta, Gamma and X-rays in medical, educational and industrial applications.

- ◆ Compact design
- ◆ Dual milliRad (mR) per hour or counts per minute (CPM) analogue scale display with three selectable ranges and separate, user selectable count bleeper
- ◆ Battery powered

Ranges	mR/hour	0 to 0.5, 0 to 5, 0 to 50
	CPM	0 to 500, 0 to 5000, 0 to 50,000
Sensitivity	Alpha	Down to 2.5MeV; detection efficiency typically >80% at 3.6MeV
	Beta	Typically 35% at 50KeV or 75% at 150KeV
	Gamma and X-rays	Down to 10KeV typically through the end window, 40KeV minimum through the case
Detector		Halogen-quenched, uncompensated G-M tube with mica end window 1.5 to 2mg/cm <sup>2</sup> thick
Display		Analogue with dual scale and red LED count light
Audio indicator		User selectable count bleeper
Power		9V battery (IEC 6F22)
Overall L x W x D mm		210 x 70 x 48
Weight	g	246

### Monitor 4 Radiation Survey Meter

As described. With battery.

- RA250-10** Monitor 4
- BL610-25** 9V battery



RA250-10

## Digital Radiation Monitor, Monitor 200

- ◆ Monitors Alpha, Beta, Gamma and X-rays
- ◆ Accumulated counts or counts per minute (CPM) or mR/hr
- ◆ Halogen-quenched, uncompensated Geiger-Müller tube detector
- ◆ Digital display and audio-visual count bleeper with mute
- ◆ Adjustable audio alert level on mR/hr and counts per minute readings
- ◆ USB output for datalogging or warning devices

Ranges	mR/hour	0.001 to 200 (Cs-137)
	Sv/hr	0.01 to 1000
	CPM	0 to 214,000
	CPS	0 to 3575
	total counts	1 to 9,999,000
Sensitivity	Alpha	Down to 2.5MeV; detection efficiency typically >80% at 3.6MeV
	Beta	Typically 35% at 50KeV or 75% at 150KeV
	Gamma and X-rays	Down to 10KeV typically through the end window, 40KeV minimum through the case
Gamma sensitivity		1000CPM or mR/hour
Display		Digital with red LED count light
Output		Mini USB
Power		2 x 1.5V AA batteries
Overall L x W x D mm		140 x 68 x 33
Weight	g	220

### Monitor 200 Monitor

As described. Supplied with soft carrying case, protective boot, USB output and Observer USB software and batteries.

- RA275-45** Monitor 200
- RA275-94** Rugged ABS/PC field case, water-resistant to IP65, for RA275-45
- BL610-15** 1.5V battery (2 required)



RA275

## Digital Radiation Monitor, Ranger

Handheld digital meter with excellent sensitivity to low levels of Alpha, Beta, Gamma and X-rays.

- ◆ Accumulated counts, counts per minute, counts per second, timed period counts, mR/hr or Sv/hr selectable, with adjustable alarm
- ◆ Halogen-quenched, uncompensated Geiger-Müller tube detector
- ◆ USB outputs for datalogging or TTL devices

Ranges	mR/hour	0.001 to 100
	Sv/hr	0.01 to 1000
	CPM	0 to 350,000
	CPS	0 to 5000
	total counts	1 to 9,999,000
Timer		1 to 10 x 1 minute
		10 to 60 x 10 minutes
		1 to 24 x 1 hour
Display		Digital with red LED count light
Output		Dual mini Jack drives and USB
Power		2 x 1.5V AA batteries
Overall L x W x D mm		150 x 80 x 30
Weight	g	250

### Sensitivity to common isotopes

Isotope	Energy	Efficiency
Alpha		
241AM	5.5MeV	18%
Beta		
14C	49keV average 156keV max.	5.3%
210Bi	39keV average 1.2MeV max.	32%
90 Sr(Y)	546keV and 2.3MeV	38%
32P	693keV average 1.7MeV max.	33%
Gamma		
	3340CPM or mR/hr referenced to Cs-137	
	Smallest detectable level for I-125 is 0.02 Ci at contact	

### Ranger Monitor

As described. Supplied with soft carrying case, protective boot, USB output and Observer USB software. With battery.

- RA280-50** Ranger
- BL610-15** 1.5V battery (2 required)
- BL610-25** 9V battery



RA280

# Radiation Shielding

## Radiation Shielding



Designed to provide maximum shielding during procedures which require the handling of  $\beta$ -emitting isotopes, such as  $^{32}\text{P}$ ,  $^{90}\text{Y}$  and  $^{35}\text{S}$ .

- ◆ Manufactured in transparent acrylic
- ◆ Label showing radiation symbol and legend Caution – "Radioactive Material" supplied with each shield

### Benchtop Beta Shields

Free standing stable shields in transparent acrylic 9.5mm thick. With angled top and 300mm deep base which provides a flat working surface and minimises the risk of "hot spots" on the laboratory bench.

	Ref. 6700	H x W x D mm
<b>RA400-10</b>	-1812	457 x 305 x 305
<b>RA400-15</b>	-2418	610 x 457 x 305

### SAFETY NOTES

- 1) These shields are unsuitable for use against secondary x-rays (Bremsstrahlung) or gamma radiation.
- 2) Radioactive waste must never be stored on the benchtop for long periods and must be disposed of properly. Proper handling and storage of isotopes minimises unnecessary exposure to radiation.

### Beta Waste Containers

Transparent acrylic 9.5mm thick. Supplied with polyethylene screw cap bottle to contain aqueous waste solutions such as buffers. The shield encases the waste bottle without obstructing access to the bottle cap.

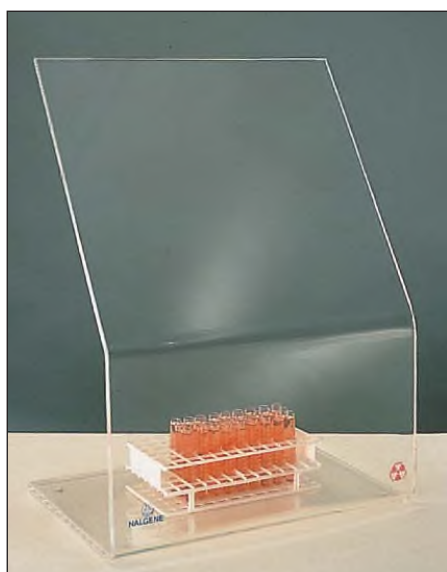
	Ref. 6710	Dia. mm	Cap. litre
<b>RA405-17</b>	-2000	140	2

### Beta Waste Shield

Transparent acrylic 9.5mm thick. Accommodates large containers. A large hinged door in the cover allows easy access to the waste receptacle and a tray sits within the shield to contain spillage. Hinged corners allow removal of the container and the shield can be collapsed for storage.

	Ref. 6745	H x W x D mm
<b>RA416-16</b>	-9024	737 x 457 x 457

Benchkote bench protection to contain radioactive spillage – see SA200 in the Safety section.



RA400 in use



RA405 in use



RA416 in use

# Radiation Shielding

## Beta and Gamma Radiation Shielding

- ◆ Choice of construction/shielding types
  - clear optical acrylic, minimum 10mm thick, for shielding against beta particles
  - clear lead acrylic\*, minimum 12mm thick, for shielding against gamma particles

\*Note: Lead acrylic has a slight yellowish tint.

### Safety shields

Fixed angle pattern with stable, curved base and single face angled at 15°. Dimensions stated are H x W x D.

### For beta radiation

**RA600-20** 450 x 300 x 150mm  
**RA600-30** 530 x 350 x 150mm

### For gamma radiation

**RA604-20** 450 x 300 x 150mm  
**RA604-30** 530 x 350 x 150mm

Hourglass and dual angled patterns are also available on request.

### Storage boxes

A range of benchtop storage boxes with hinged lids to accept accessory inserts as indicated. Dimensions stated are H x W x D.

### For beta radiation

**RA612-15** Mini-box, 75 x 105 x 105mm  
**RA612-25** Midi-box, 80 x 185 x 105mm  
**RA612-35** Maxi-box, 160 x 300 x 185mm

### For gamma radiation

**RA615-25** Midi-box, 84 x 189 x 109mm  
**RA615-35** Maxi-box, 164 x 304 x 189mm

### Accessory racks

To fit storage boxes and hold tubes as indicated.

### For Mini-boxes

**RA623-15** 16 x 1.5ml Eppendorf tubes  
**RA624-15** 20 x 0.5ml Eppendorf tubes

### For Midi-boxes

**RA626-25** 32 x 1.5ml Eppendorf tubes  
**RA627-25** 40 x 0.5ml Eppendorf tubes  
**RA628-25** 16 x 0.5ml and 1.5ml Eppendorf tubes  
**RA629-25** 32 x 2ml cryotubes

### For Maxi-boxes

**RA632-35** 15 x 15ml centrifuge tubes  
**RA633-35** 8 x 50ml centrifuge tubes  
**RA634-35** 3 x Falcon tubes, 8 x 1.5ml tubes  
**RA635-35** 8 x 20ml scintillation vials  
**RA636-35** 15 x 5ml scintillation vials  
**RA637-35** 8 x 30ml universals

### Tip boxes

With hinged lid and pipette tip port which is itself covered by a small hinged lid. For single channel pipettors. Overall 150 x 150 x 150mm H x W x D, capacity 2 litres. Accessory heavy duty plastic liner bags are also available.

**RA640-10** For beta radiation shielding  
**RA645-20** For gamma radiation shielding  
**RA662-05** Accessory liner bags for RA640-10 and RA645-20, pack of 25

### Disposal bins

With hinged lid and anti-slip feet. Capacities and dimensions (H x W x D) in mm as indicated.

### For beta radiation

**RA650-20** 3.3L, 170 x 180 x 170  
**RA650-40** 10L, 270 x 220 x 220  
**RA650-60** 47L\*, 600 x 305 x 290  
**RA650-80** 50L, 420 x 510 x 290

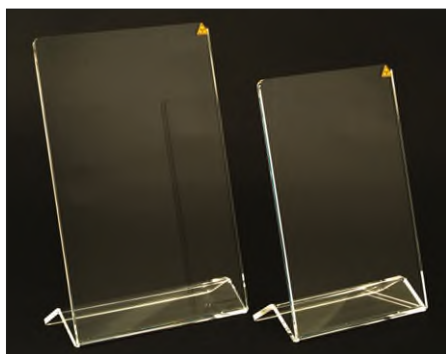
\*Mounted on castors for easy manoeuvrability.

### For gamma radiation

**RA657-20** 3.3L, 174 x 174 x 174  
**RA657-40** 10L, 274 x 224 x 224  
**RA657-60** 50L, 424 x 514 x 294

### SAFETY NOTES

- 1) Beta radiation shields are unsuitable for use against secondary x-rays (Bremsstrahlung) or gamma radiation.
- 2) Gamma radiation shields will block emissions effectively from <sup>125</sup>I and any low energy gamma emitters. They are not suitable for more energetic isotopes of iodine. Heavier-walled shields are available for use with these isotopes - details on request. Gamma shields must not be used with beta isotopes since Bremsstrahlung will be produced.
- 3) Radioactive waste must never be stored on the benchtop for long periods and must be disposed of properly. Proper handling and storage of isotopes minimises unnecessary exposure to radiation.



RA600, RA604 are similar



RA612-25 with accessories, RA615-25 is similar



RA612-15 in use with accessories



RA640 in use, RA645 is similar



RA650-60

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