

Radiation Safety Short Course

RADIOISOTOPE LABORATORY TECHNIQUES PART 1

*University of Florida
Environmental Health & Safety
Radiation Control & Radiological Services*

Thank you for joining me for Chapter 6, of the Radiation Safety Short Course, part one of Radioisotope Laboratory Techniques.

OBJECTIVES

- To provide you with the information to work smarter and safer!
- To fulfill the requirements of the University of Florida's Radioactive Materials license.

Our goal here at Radiation Safety is to provide you, the authorized radioactive material user, with the information to work smarter and safer! In doing this we are also fulfilling the requirements set forth by the University of Florida's Radioactive materials broad-scope license.



Radiological postings you may see in your labs may include those identifying the Authorized lab (such as the Caution – Radioactive material posting), those identifying Radioactive material work areas, and those identifying refrigerators, freezers, or coolers used for storage of radiological material.

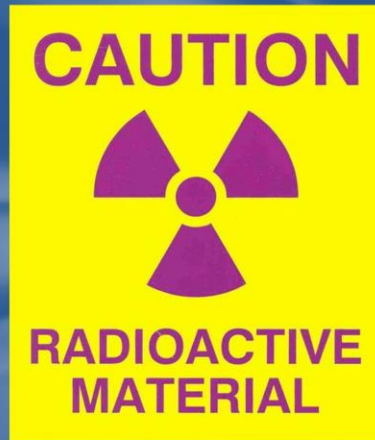
POSTINGS

On door to laboratory

- Lab contains or is approved to contain radioactive material
- No eating, drinking, smoking, or applying cosmetics inside the room

On container, drawer, or instrument

- Radioactive sources are stored or used in this area
- Instrument could contain radioactive source
- Don't open it or touch it unless an Authorized User.



The "Caution Radioactive Material" posting is used on the entry way into the lab. It may also be located on the Notice Board. These postings are meant to alert those entering that the lab is approved for use of radioactive material and may contain radioactive material. Also, if you see this posting you should never eat, drink, smoke or apply any type of cosmetics inside the room.

The "Caution, Radioactive Material" posting should also be placed on containers, drawers or instruments in which radioactive sources are used or stored. They are also used to identify equipment that contain radioactive sources. These **should** cause individuals who are not authorized users to think twice about disturbing anything labeled as such.

POSTINGS

Must be posted in Work Areas

- On hoods
- On bench tops

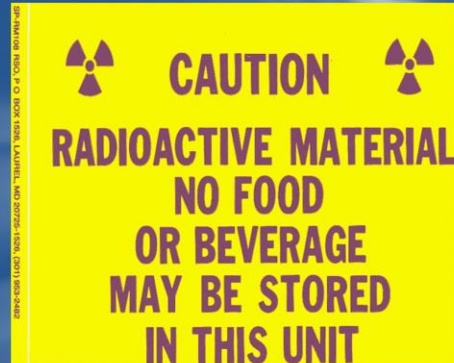


All work areas on which radioactive material is used shall be labeled as Radioactive material work areas. This includes hoods and bench tops.

POSTINGS

Must be posted on Freezers,
Refrigerators, or Cold Rooms.

**Do NOT store food or beverages
in these units!**



SURVEY INSTRUMENTS

- Battery Check
- Calibrated within the last 9 months?
- Proper meter for isotopes in use?



As we discussed in Chapter 4, if using survey instruments always check the battery strength before using! Check the side of the meter to ensure it has been calibrated within the last 9 months and ensure you are using the proper meter for the isotopes you will be using.

PROTECTIVE CLOTHING

- Lab coat
- Gloves
- Eye protection



Remember your protective clothing! Always wear your lab coat, gloves and eye protection. They are there for a reason, use them.

GENERAL LAB SAFETY

- Absorbent paper used in designated work areas (plastic side down)
- No food or drinks in work area
- Proper shielding for isotopes
- Survey of hands and feet after every use

Four general, yet valuable, lab safety rules to remember: 1) use absorbent paper in designated work areas (this makes cleanup so much easier), 2) no food or drinks allowed in work areas (you don't want to risk ingesting radioactive material), 3) make sure you are using the proper shielding for the isotopes you are working with, and 4) always survey your hands and feet after every use.

WASTE AREAS

- Ensure appropriate catchtrays under liquids
- No funnels left in liquid waste containers.

When evaluating the waste areas, ensure appropriate catch trays are under liquid containers. Make sure if the liquid container were to rupture the catch tray is large enough to contain the volume of liquid waste. Also, remember to remove the funnel once you have completed pouring waste into the liquid waste container. If the funnel is still in the waste container when the quarterly lab inspection is completed the lab will be cited for improper waste storage.

When to
document a
survey?

A survey **must** be documented
within **seven** days of isotope use
(Best to schedule one day a
week)

OR

If the lab has isotope storage
only (no use) or waste still on
hand...a documented survey
once a month

RADIATION/CONTAMINATION SURVEY

PRINCIPAL INVESTIGATOR: Dr. Who

SURVEYOR: Jack ROOM NO. 13

RADIONUCLIDES USED: P-32 SURVEY NO. 10

SURVEY TYPE: WEEKLY DATE: 05/10/08

RADIATION READINGS:

Survey Meter Model & Serial #
Ludlum L-3 SN 5288974

Area	Reading (mR/hr)
Work Area	0.004
Waste Facilities	0.003
Storage Areas	0.004

CONTAMINATION SURVEY RESULTS
Counting Instrument Model & Serial #
Beckman LS-8000 SN 8577571152

Detection Efficiency 75% for isotope P-32

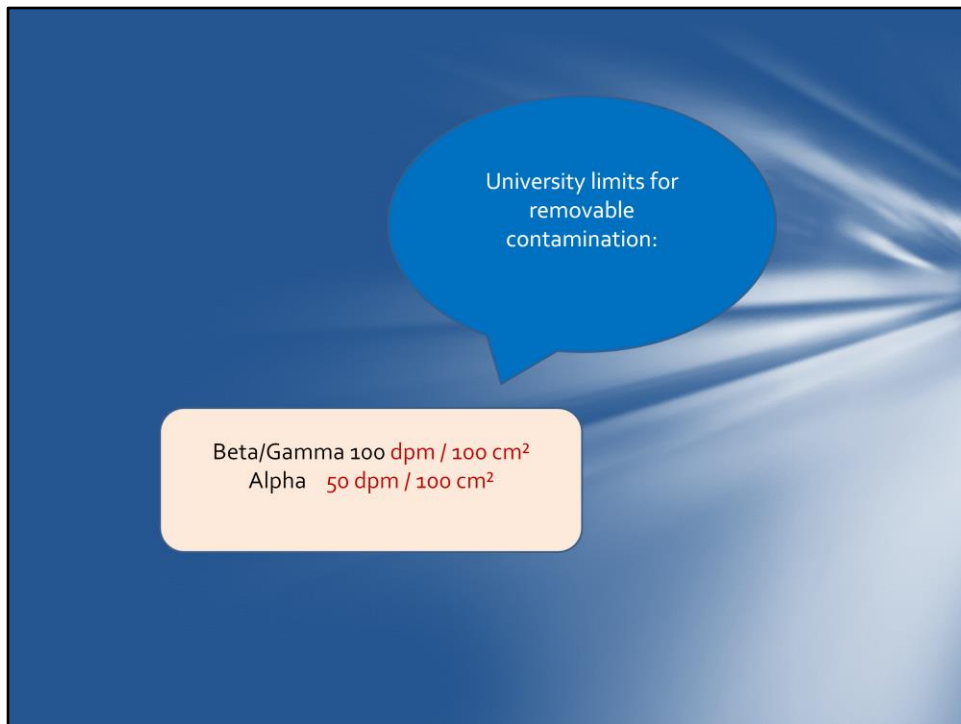
#	Swipe Identification	Net cpm	Net dpm*	Post Decon dpm
1	Bench	74	99	
2	Floor	250	333	54
3	Sink	20	26	
4	Door	50	67	
5	Floor	5822	7762	88
6	Phone	40	53	
7	Cabinet	10	13	
8	Fuge	44	59	
9	Hot plate	13	17	
10	Liq waste jug	55	73	
11	Desk	10	13	
12	Floor	60	80	

*Areas of greater than 100 dpm/swipe must be resurveyed and documented.

DPM = Gross CPM minus background divided by the efficiency of the counting instrument for the particular radionuclide.

DETAILED LABORATORY LAYOUT

You must remember to complete and document a survey within 7 days of isotope used. If your lab is not actively using radioactive material, just storing radioactive material or has radioactive waste, then a survey must be completed and documented once a month.



The University of Florida has limits set for removable contamination. They are 100 dpm/ 100 square centimeters for beta/gamma emitters and 50 dpm/100 square centimeters for alpha emitters.

LAB SURVEY & DOCUMENTATION



Lab surveys and documentation – the following videos will provide you with some important information on how to work with radiological material and how to complete radiological surveys.



TOP PRIORITY.....

SECURITY!

Challenge everyone that you do not know!

Remember, one of your top priorities is to maintain security of radioactive material. If you are leaving the lab for any length of time, lock it. It is important to challenge anyone in your lab that does not belong, whether you know them or not.