



Radiation Dosimetry - Introduction

Dosimetry tracks and monitors external radiation exposures. Dosimetry use ensures that we are following the principle of ALARA, keeping exposures As Low As Reasonably Achievable. The Harvard EH&S Radiation Protection Office (RPO) coordinates the dosimetry program, which uses dosimetry products from Landauer, Inc. (Accredited by The National Voluntary Laboratory Accreditation Program, NVLAP). Radioactive material users are monitored and the results are sent to the Permit Holder. Dosimetry results are available from the Permit Holder.



All radioactive material users and others occupying radioactive material use areas wear radiation dosimetry. In most cases, dosimetry is issued every other month. Wear your dosimetry when in the laboratory.

It is important to remember that dosimetry only measures external radiation exposure and offers no protection from radiation.

The Luxel OSL Whole Body Dosimeter



The Luxel OSL (Optically Stimulated Luminescence) Whole Body Dosimeter is a replacement for traditional film badges. The enhanced features of this dosimeter include higher sensitivity, wider range of exposure measurement, greater precision, increased environmental stability, and an extended wear period (2 months). The Luxel dosimeter can measure gamma/X-ray exposures down to 1 mrem and beta exposures down to 10 mrem. With this increased precision and sensitivity, results are reported as measured unlike the film badge that was reported in increments of 10 mrem. As a result, smaller exposures are reported with the Luxel dosimeter.



The Ring Dosimeter

The TLD (Thermoluminescent Dosimeter) rings measure exposures to your extremities and skin. A TLD is required when working with more than 1 mCi of ³²P, ¹²⁵I, ⁵¹Cr or an X-ray diffraction unit. The TLD is enclosed within the ring and is labeled and sealed with a



Laboratory Safety

laser etched cover. The TLD is designed to wear inside disposable gloves, and comes in a range of sizes (S, M, and L). The TLD ring can measure 30 mrem to 1,000 rads for gamma/x-rays and 40 mrem to 1,000 rads for betas.

When to wear dosimetry?

Wear a Whole Body Dosimeter at all times when working with or around radiation sources. This means you need to wear your dosimetry when you are working with radioactive materials or are in an area where work is performed with radionuclides or radioactive waste storage areas. Do not wear someone else's dosimeter. Notify the Radiation Safety Office if your badge or ring has been damaged or lost.

Where to wear dosimetry?

Your whole body dosimeter should be worn on your torso, positioned so that it is closest to the source of radiation. Wearing it on your chest or at bench level are two suitable locations. It can be worn inside or outside your lab coat. If you wear it outside, use caution to prevent contamination.



Wear your TLD ring on the hand you use most often to handle radioactive materials, with the text side facing the inside of your palm.



Dosimeter Exchange

Most dosimeters (Whole Body and Finger Ring) are issued for two months. A new dosimeter should arrive by the first of odd numbered months (e.g. January, March, May, July, Sept., November). Exchange dosimeters during the first week of the month. Exchange old dosimeters with the new one by snapping the dosimeter out of the plastic holder. Place all the laboratory's dosimeters into an envelope and return them to the Harvard Radiation Protection Office when all the badges are exchanged. If for some reason all of the lab's dosimeters cannot be exchanged by the end of the second week, return the collected ones to expedite return of the remainder.

Each Luxel dosimeter is color coded for each bi-monthly period as shown here:



The TLD ring is color coded for each wear period and the wear period is printed on the third line of the label.



Dosimeter Labeling

Luxel OSL Whole Body Dosimeter



TLD Ring Dosimeter



How do I find out my exposure?

The Radiation Protection Office reviews all dosimetry results shortly after processing for unusual or unexpected doses. Every two months dosimetry reports are sent to your Permit Holder. The report includes the individual's participant number, type(s) of dosimeter, and the dose for the monitoring period and year to date. The report may be posted for your lab or the results may be made available by other means, such as individual communication. You can request your results at any time from the Permit Holder or the Radiation Protection Office.

Exceeding ALARA levels is very rare, but if this should happen, the researcher will be notified and the Radiation Protection Office will investigate the exposure. To exceed ALARA, the measured dose would be 125 mrem in a calendar quarter (Investigation Level I) or greater.

Email radiation_protection@harvard.edu to send comments and suggestions to the Radiation Protection Office