

Polaroid Corporation
300 Fifth Avenue
Waltham, Massachusetts 02254



RADIATION SAFETY RULES

10-4606

I. General Radiation Safety Procedures

A. Training, Authorization and Registration

1. Training

All individuals assigned to work with or near a source of ionizing radiation must complete radiation protection training by the Radiation Safety Officer (RSO), or division personnel qualified by the RSO to perform such training. This training shall cover:

- o the biological effects associated with exposure to ionizing radiation, including consideration of prenatal exposure
- o applicable radiation protection techniques
- o emergency procedures
- o applicable Federal, State, and local regulations.

2. Authorization

- All users of ionizing radiation must receive prior authorization from the Radiation Safety Officer (RSO).
- All purchase requisitions for sources of ionizing radiation must be countersigned by the RSO before being submitted to the purchasing department.

3. Registration

- All sources of ionizing radiation must be registered with the Radiation Safety Officer (RSO).
- The RSO will assure that each source is in turn registered with the appropriate regulating agency (e.g. NRC, State).
- A Polaroid Radiation Safety Office label indicating that registration is complete shall be affixed to each source or its enclosure.

B. Personnel Monitoring

Each individual assigned a personal radiation monitor shall:

- o Wear the monitor properly whenever occupational radiation exposure may occur.
- o Wear only the monitor assigned.
- o Store the monitor in a location where it will receive minimal exposure when not being worn.
- o Return the monitor promptly to the Radiation Safety Office when a replacement is received (usually monthly).

C. Maximum Permissible Dose (MPD)

- Individuals using sources of ionizing radiation shall perform their work in a manner that will minimize radiation exposure or risk to themselves, their fellow-workers and the general public.

It is Polaroid's policy that radiation exposure shall be kept as low as is reasonably achievable. In keeping with this policy, it is expected that the average occupational dose to radiation will be controlled to less than 25% of the following Nuclear Regulatory Commission values for Maximum Permissible Doses:

<u>PART EXPOSED</u>	<u>M.P.D. IN REMS PER CALENDAR QUARTER</u>
1. Whole body, head and trunk, active blood-forming organs, lens of eyes and gonads	1.25
2. Hands and forearms, feet and ankles	18.75
3. Skin of whole body.	7.50

The following should be used as guides for controlling average doses to below 25% of the above MPD values:

<u>PART EXPOSED</u>	<u>AVERAGE WEEKLY VALUE</u>	<u>DOSE RATES FOR 40 HOURS/WEEK</u>
1. Whole body, etc.	25 mrem	0.6 mrem/hr.
2. Hands and forearms	375 mrem	9.4 mrem/hr.
3. Skin of whole body	150 mrem	3.8 mrem/hr.

D. Emergency Procedures

- In the event of a known or suspected overexposure to ionizing radiation, immediately notify your supervisor, who will notify the Radiation Safety Officer (RSO).
- If your supervisor is not available, notify the RSO yourself.
- For instructions specific to your source of ionizing radiation, see the appropriate section below.

II. Radiation Safety Procedures for Possession, Use and Disposal of Radioactive Materials

A. General Rules for Radioactive Materials

1. Each supervisor shall maintain an inventory of all sources for which he is responsible.
2. Radioactive material shall be used only by persons who have completed appropriate radiation protection training approved by the Radiation Safety Officer (RSO).
3. Radioactive material shall be handled, used, or stored only in Polaroid's rooms or laboratories that are registered with the RSO as being approved for such operations.
4. Radioactive material shall not be transferred to another project, or to another company without the prior authorization of the RSO.
5. Radioactive wastes shall be disposed of in a manner that has been approved by the RSO,
 - e.g. - By placement into an RSO-supplied container specifically designated for radioactive waste.
 - By transfer to the RSO.
6. Storage of radioactive material shall be done in a manner that complies with the following:
 - a. Each outer container shall be labeled with an approved label (i.e. magenta on yellow with radiation symbol) with the nuclide, amount of activity, and date specified.
 - b. Storage shall be done in a manner that minimizes the possibility of:
 - (1) Breakage of primary containers
 - (2) Exposure to fire
 - (3) Unauthorized removal
 - (4) Unnecessary exposure to personnel

7. Unless otherwise authorized by the RSO, transportation of radioactive material from one location to another shall be done in conformity with the following:
 - a. The material shall be transported in a closed, shatter-proof container that is properly labeled. Where transportation involves travel outside the confines of property owned or leased by Polaroid, the packaging and labeling shall comply with applicable Dept. of Transportation regulations.
 - b. The measured dose rates shall not exceed:
 - (1) 100 mrem/hour at any point on the external surface of the container or package.
 - (2) 5 mrem/hour at one meter from any external surface of the container or package.
 - c. There shall be no detectable transferrable contamination on exterior surfaces as determined by an appropriate wipe test and survey meter evaluation of the wipe test.
 - d. When hand-carried from one location to another, the radioactive material shall be in the possession and responsible charge of an authorized user of the material.
8. Unless otherwise authorized by the RSO, receipt of radioactive material shall be done in conformity with the following:
 - a. Specifically licensed material shall be delivered directly to the authorized user.
 - b. The external radiation dose rate from packages containing specifically licensed material shall be measured upon receipt to determine the following:
 - (1) That the dose rate does not exceed the values given in Section II.A.7.b. above. If either b.(1) or b.(2) does not hold true the RSO should be contacted promptly.
 - c. If the material being delivered is in an unsealed form and/or is not exempt under 10 CFR Part 20.205(b) of the NRC regulations, the package shall be monitored for surface radioactive contamination. Contact the RSO for guidance on how and when to do such monitoring.
 - d. The RSO shall be notified promptly of the receipt of any licensed radioactive material.
 - e. The individual receiving specifically licensed material shall keep a record of its receipt including the date, isotope, activity and the results of any monitoring required upon receipt of the material.

B. Specific Rules for Users of Unsealed Radioactive Material

1. There shall be no smoking, eating, drinking or application of cosmetics in areas where unsealed radioactive sources are used.
2. There shall be no storage of smoking materials, food or cosmetics in areas where unsealed radioactive sources are used or stored.
3. Mouth pipetting shall not be performed with radioactive material.
4. Lab coats shall be worn in Radioisotope Laboratories. Potentially contaminated lab coats shall not be worn outside of a Radioisotope Laboratory.
5. Protective gloves shall be worn during the performance of operations that might produce hand contamination.
6. A ventilated hood, approved by the Radiation Safety Officer (RSO), shall be used for any operation that might result in airborne contamination.
7. Prior to performing operations on a source of radioactive material, radiation levels shall be measured. Handling tongs, or a suitable remote-handling device must be used for handling a source which emits a dose rate, at contact, in excess of 200 millirem/hour.
8. Before leaving a Radioisotope Laboratory, hands shall be washed and exposed skin and clothing shall be surveyed for contamination. If skin contamination is detected after washing, the RSO shall be notified.
9. Potentially contaminated materials and equipment shall not be removed from a Radioisotope Laboratory without prior authorization of the RSO unless survey measurements have established that no surface contamination was detectable.
10. If an accidental spill or splashing of a radioactive solution occurs, the RSO shall be notified* as soon as possible and the following steps taken:
 - a. If personal injury is involved, notify medical immediately.
 - b. Remove contaminated clothing and leave garments near spill area.
 - c. Move to a sink in the laboratory that is outside of the spill area, and wash potentially contaminated skin surfaces.
 - d. While waiting for the Radiation Safety Officer (RSO) (or his representative) to arrive, stay in one area to prevent tracking and dispersion of contamination.
 - e. Do not resume operations until authorized by the RSO or his representative.

III. Radiation Safety Procedures for Equipment That May Emit Ionizing Radiation (e.g. X-ray units, electron microscopes)

- A. No equipment modification (including changes in the shielding) that may increase the amount of radiation emitted shall be made without prior approval of the Radiation Safety Officer (RSO).
- B. In the event of an accidental exposure to ionizing radiation, the RSO should be notified* as soon as practicable and the following steps be taken:
 1. Stop work with the equipment and do not resume until authorized to do so by the RSO.
 2. Notify your supervisor immediately.

If further information is desired please contact the Radiation Safety Officer in Waltham at PTN 222-2827.

*Notification of Radiation Safety Officer:

- During normal work hours ext. 2827 in Waltham
- After normal work hours, consult Division Emergency Manual, or contact Site Security Office, for home telephone number of RSO or Associate RSO.