

Lead Shielding Consideration

PLEASE NOTE: ALL LEAD SHIELDING REQUIREMENTS MUST BE CALCULATED BY LISCENCED RADIATION HEALTH PHYSICIST!

The following considerations will be made to determine the proper lead shielding for each application. Calculations and considerations for lead shielding will differ for diagnostic machines and radiation therapy machines.

1. **Energy Potential:** What is the energy potential of the machine? This is measured in kVp (kilovolt peak) for most diagnostic machinery, and mVp (megavolt potential) for radiation therapy equipment.
2. **Distance:** Typically, the closer a partition is to the radiation source, the greater the lead shielding requirement. Radiation will dissipate more as the distance lengthens between the partition and the radiation source.
3. **Orientation:** The lead shielding on each wall in the imaging or therapy room will be calculated based on the orientation of the machine in relation to the direction of the primary beam target and secondary scatter.
4. **Workload:** How many times will this machine be used each day/week/year, factoring in expected growth in patients.
5. **Occupancy:** What is the occupancy level of the rooms surrounding the diagnostic or radiation therapy room? How many times during the day will a given room adjacent to the radiation source room be occupied? This is why there is sometimes little to no lead required on floors and ceilings.
6. **Materials:** Often times consideration will be given to the existing construction materials at a location. For instance, concrete, when thick enough serves as a suitable shield for radiation.
 - ALL PENETRATIONS AND SEAMS REQUIRE LEAD SHIELDING OF EQUAL VALUE.
 - MINIMUM HEIGHT IN MOST CASES, ACCORDING TO THE NCRP REPORT #147, IS SEVEN FEET.

These considerations should help you in understanding what goes into calculating lead shielding requirements both for diagnostic imaging and radiation therapy.

The information contained on our website, submittals, specifications, etc... is offered for assistance in specifying products and materials from Radiation Protection Products, Inc. It is not intended to be complete and Radiation Protection Products, Inc. does not assume any responsibility for the adequacy of the submittals/specifications for a particular application. These submittals/specifications are subject to change without notice and without incurring obligation. Actual performance may vary in specific applications. An appropriate and qualified design professional/structural engineer must verify suitability of products for use in a particular application, as well as review final submittals/specifications. Radiation Protection Products, Inc.