

## **Video Transcript**

**Title: Types of Ionizing Radiation and Shielding Required**

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**Length: 01:51**

**Begin transcript**

Alpha particles may be ejected from the nucleus of an atom during radioactive decay. They are relatively heavy and only travel about an inch in air. Alpha particles can easily be shielded by a single sheet of paper, and cannot penetrate the outer dead layer of skin, so they pose no danger when their source is outside the human body.

Beta particles are essentially electrons emitted from the nucleus of a radioactive atom. They are lighter than alpha particles, and can travel farther in air, up to several yards. Very energetic beta particles can penetrate up to one half an inch through skin and into the body. They can be shielded with less than an inch of material such as plastic. In the case of lower energy beta particles, the outer layer of clothing can act as an effective shield.

Gamma rays can be emitted from the nucleus of an atom during radioactive decay. They are able to travel tens of yards, or more, in air, and can easily penetrate the human body. Shielding this very penetrating type of ionizing radiation requires thick dense material such as several inches of lead or concrete.

Neutrons can be released from the nucleus of an atom during a fission reaction, such as within a nuclear reactor, or upon detonation of a nuclear weapon. Neutrons, like gamma rays, are very penetrating, and several feet of concrete is needed to shield against them.

**End transcript**

**For inquiries regarding this video, please contact:**

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