



Radiation and Airport Security Scanning

To help keep travelers safe, airports may use different kinds of screening equipment such as backscatter x-ray machines, cabinet x-ray machines, millimeter wave machines and metal detectors.

- People may be screened with backscatter x-ray machines. They use very low levels of ionizing radiation.
- People may be screened with millimeter wave scanners. They use radiofrequency (non-ionizing) radiation.
- Metal detectors use no radiation.
- Luggage is screened with cabinet x-ray machines. No radiation leaves the machine.

About Radiation and Airport Security Scanning

Keeping public places, such as airports, safe is a big job. Transportation Security Administration (TSA) screeners at airports check passengers and suitcases for dangerous items such as weapons. To do their job, they use different kinds of screening equipment such as backscatter x-ray and cabinet x-ray machines. They also use millimeter wave machines and metal detectors.

- Some of this screening equipment uses ionizing radiation, which has enough energy to break bonds in living cells. X-ray machines use ionizing radiation.
- Other airport security screening machines use non-ionizing radiation. Non-ionizing radiation does not have enough energy to break bonds in living cells. Millimeter wave machines use low-energy non-ionizing radiation.
- Some equipment uses no radiation at all. Passengers at some airports have to pass through metal detectors. This equipment does not use radiation.

Luggage is scanned with cabinet x-ray systems. The thick walls and lead curtains of the cabinets keep radiation from escaping. The machines must meet strict standards about how much radiation can escape. The machines must also have locks, warning lights and warning labels.

Remember: Backscatter x-ray systems use very low levels of radiation.

Passenger scanners can detect threats such as weapons or explosives that a person could be carrying under their clothing. There are two main types that may be used in airports: backscatter x-ray systems and millimeter wave machines.

Backscatter machines use very low levels of x-rays. Generally, the amount of radiation received from a backscatter machine equals the amount of cosmic radiation received during two minutes of flight. The risk of health effects is very, very low. The machines are effective at detecting items that would be a threat to other passengers and crew.

Millimeter wave machines use radiofrequency waves to detect threats. The machine bounces the waves off the body. Millimeter wave scanners emit thousands of times less energy than a cell phone. Threats are shown on

a generic body outline rather than the person's actual outline. When there are no weapons or other threats, the screen turns green and shows an "OK."



Millimeter wave scanner display when no threat is found.



Millimeter wave scanner display showing a threat.

Rules and Guidance

U.S. DEPARTMENT OF HOMELAND SECURITY (DHS), TRANSPORTATION SECURITY ADMINISTRATION (TSA)

TSA uses x-ray machines to screen carry-on luggage. TSA x-ray equipment must meet FDA requirements (see below) to ensure that passenger and worker exposure to radiation is as low as possible. TSA's occupational safety and health professionals lay out specifications that meet FDA requirements for screening equipment. They test the equipment when it is set up and may bring in outside specialists to test it. In addition, TSA maintains the equipment and keeps it in good working order. At least once a year, the equipment is tested to make sure it meets national safety standards.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS), U.S. FOOD AND DRUG ADMINISTRATION (FDA)

FDA's Center for Devices and Radiological Health (CDRH) makes sure that all x-ray systems and other radiation emitting screening equipment are built to use radiation safely. FDA requires that all machines be correctly set and maintained. Their rules apply to medical and other uses of radiation-emitting equipment.

What you can do

Airport screening helps keep travelers safe by finding weapons. The risk of health effects from backscatter x-ray systems is very, very low. However, if you are worried about x-ray or millimeter wave screening, ask for a pat-down search instead.

Where to learn more

You can learn more about radiation and airport security scanning by visiting the resources available on the following webpage: <http://www3.epa.gov/radtown/airport-security-scanning.html#learn-more>.