

Radioisotope instruments have three great advantages:

- ◆ Measurements can be made without physical contact with the material or product being measured.
- ◆ Very little maintenance of the isotope source is necessary
- ◆ The cost/benefit ratio is excellent - many instruments pay for themselves within a few months through the savings they allow

Radiography

Radioisotopes, which emit gamma rays, can be used to check welds of new gas and oil pipeline systems, with the radioactive source being placed inside the pipe and the film outside the welds. This is more convenient than employing X-ray equipment.

Other forms of radiography (neutron radiography/ autoradiography), based on different principles, can be used to gauge the thickness and density of materials or locate components that are not visible by other means.

Power Sources

Some radioisotopes emit a lot of energy as they decay. Such energy can be harnessed for heart pacemakers and to power navigation beacons and satellites. The decay heat of plutonium-238 has powered many US space vehicles and enabled Voyager to send back pictures of distant planets. Pu-238 powered the Cassini space probe on its way to Saturn.

Dating

Analysis of radioisotopes is of vital importance in determining the age of rocks and other materials that are of interest to geologists, anthropologists and archaeologists.

From the moment we get up in the morning, until we go to sleep, we benefit unknowingly from many ingenious applications of radioisotopes and radiation. The water we wash with (origin, supply assurance), the textiles we wear (manufacture control gauging), the breakfast we eat (improved grains, water analysis), our transport to work (thickness gauges for checking steels and coatings on vehicles and assessing the effects of corrosion and wear on motor engines), the bridges we cross (neutron radiography), the paper we use (gauging, mixing during production processes), the drugs we take (analysis, perhaps radio-pharmaceuticals) not to mention medical tests (radioimmunoassay), or the environment, which radioisotope techniques help to keep clean (environmental analytical control), are all examples that we sometimes take for granted.

Source

Australia Uranium Association,

<http://world-nuclear.org/info/default.aspx?id=104&terms=the%20peaceful%20atom>

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