



POLONIUM 210 ALPHA SOURCES

NRD ALPHA FOILS

Proven performance and versatility are important advantages of NRD's alpha foils. They can be used in a number of applications, and we are able to adapt foils to your particular form or isotope requirement. The graphs in this brochure offer more complete information. We test our foils thoroughly before shipment, and they comply with all regulations regarding isotopes and concentrations.

APPLICATIONS

In our modern production facility, we manufacture reliable, efficient radiation sources for industrial and research applications. Their widespread application includes use in smoke detectors, static eliminators, gas and vacuum detectors, surge arrestors and other applications where ion pairs or an ion current is desired. NRD nuclear foils have been proven to effectively contain radioisotopes with no significant sacrifice in performance.

ISOTOPES AND FORMS

A wide range of isotopes can be incorporated, as the radioactive material, but the structure is particularly suited to alpha emitters. Standard foils contain Am-241 or Po-210.

Americium 241	Polonium 210
433 yrs. [†]	138 days [†]
5.49 [†]	5.30 [†]

[†]Half Life [†]Alpha Energy Max-McV

NRD foils are typically supplied in the shape of a 2.5 mm or 5 mm diameter disc. The discs are usually mounted in some type of source holder. Other shapes and mounting techniques are available on a limited basis.

CONSTRUCTION AND PERFORMANCE

NRD's foil strength, flexibility and electrical conductivity closely resemble that of silver, since the silver backing accounts for about 98 percent of the foil thickness. The characteristics imposed by the properties of gold and silver give excellent resistance to oxidation, vacuum and heat. Because of the requirement for thin inactive overcoats, abrasion, sharp bends, or continuous flexing of foils should be avoided.

The radioisotope is incorporated into the active layer using a powder metallurgy technique. This results in a foil that is insoluble and inert to most materials, thus providing a safe sealed source. Further overcoats of gold insure the foil integrity under normal conditions.

A final patented gold plating process adds to the previous gold overcoats while also providing a means of controlling the range of the emitted particles and resultant ion current. The ion current can also be controlled by the amount of radioactivity. NRD foils can be supplied in activities ranging from a few microcuries per inch to many thousands of microcuries per inch.

CERTIFICATION

All foils are wipe or immersion leak tested to insure the radioactive integrity. A certificate of compliance accompanies all shipments.

LICENSING

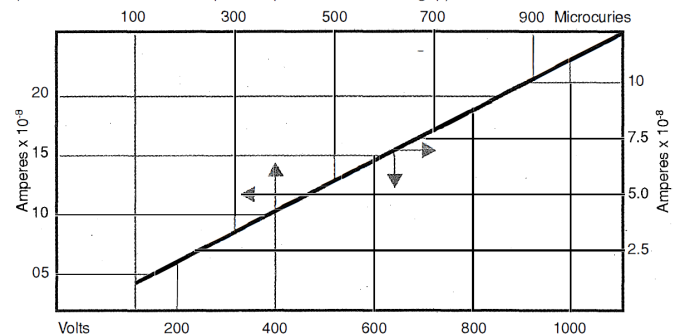
Licensing requirements vary among isotopes and concentrations. Most isotopes require a license for research and manufacturing. If the isotope is found to be safe enough for distribution to the public, a license may be granted exempting the end product from licensing.

DELIVERY & SHIPPING

Shipments are normally made by air freight. Small quantities can be shipped with no special handling. Stock samples are available in limited quantities within 10 days of receipt of request.

Ionization produced in air at 1200 VDC

(Measured in 3" diameter parallel plates with 1-1/2" gap)



Ionization produced in air at 500 microcuries

(Measured in 3" diameter parallel plates with 1-1/2" gap)

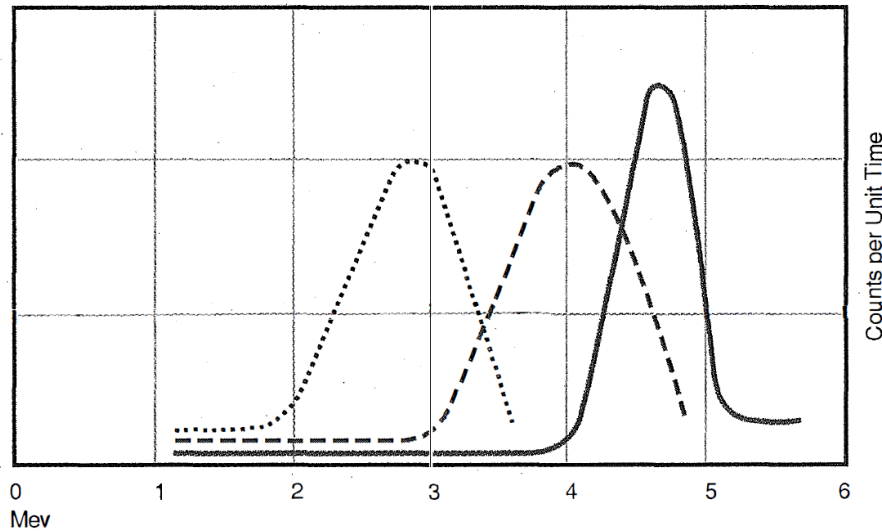
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Energy spectrum of Americium 241

Alpha particle from typical foil (solid line) other energy spectrums (shown) are available.



Ionization produced in air flow for low concentration foils

The table below gives some representation of ion currents for various amounts of radioactivity at 9 VDC and 24 VDC in 3" diameter parallel plate ion chamber at 3/8" separation.

Content Microcuries	Ion current x 10¹² amps at 9 VDC	Ion current x 10¹² amps at 24 VDC
.35	33	34
.5	50	54
.7	61	78
1.0	85	108
1.7	136	191
2.2	168	242