Alpha Sources—AFR Sources

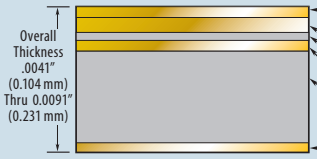
The AFR sources with rolled foils are available for Am-241 and Po-210. The standard mounting is in a type A-2 capsule (Fig 68-A) with a 9.5 mm (0.375″) active diameter.

The active element for Am-241 consists of a rolled monolithic foil in which the activity is incorporated into a thin gold layer and bonded to a 0.001 mm (0.00004″) gold cover. (Fig 67-A). The active element for Po-210 consists of a rolled monolithic foil in which the activity is incorporated into a thin gold layer and bonded to a 0.001 mm (0.00004″) silver cover. (Fig 67-B). The active foils are sealed into the A-2 capsule with a vacuum compatible epoxy resin. The resulting unit is suitable for space and other high vacuum and low temperature applications. The foil construction is extremely resistant to leakage from puncture since there is no separate window or air space. The self absorption of the gold matrix plus the integral window absorption reduces the alpha-max energy to approximately 4.7 MeV for Am-241 and approximately 4.2 MeV for Po-210. Inquiries for more accurate calibration will be quoted upon request. These sources are not sold as spectral grade sources.

The standard active area is approximately 0.71 cm^2, corresponding to the 9.5 mm (0.374″) window diameter. Contained activity is certified to ±30% of the nominal value. NIST traceability is available for contained activity of Am-241 sources up to 100 µCi (3.7 MBq). NIST traceability is not available for Po-210 sources.

Standard activities are listed below. Higher activities for both nuclides are available on request.

Figure 67-A : Am-241 Rolled Foil Cross-Section



A. Gold or Palladium Plate 0.00002″(0.00051 mm)
B. Gold 0.00004″(0.0010 mm)
C. Americium-241 & Gold 0.00002″(0.00051 mm)
D. Gold 0.00003″(0.0008 mm)
E. Silver 0.0004″(0.0102 mm) to 0.009″(0.229 mm)
F. Flash Plating for Identification

Figure 67-B : Po-210 Rolled Foil Cross-Section

A. Gold Plate Min 0.00002″(0.00051 mm)
B. Nickel Min 0.00001″(0.0003 mm)
C. Gold 0.00004″(0.0010 mm)
D. Polonium-210 and Silver 0.00002″(0.00051 mm)
E. Gold 0.00003″(0.0008 mm)
F. Silver 0.0044″(0.1118 mm) - 0.0068″(0.1727 mm)
G. Gold Plate Min 0.00002″(0.00051 mm)

AFR Sources (1, 2)

Catalog Number	Nuclide	Half-Life	Max Alpha Energy (keV)	Active Diameter	Maximum Activity
AFR-210	Po-210	138.376 days	5304	5 mm	1 µCi
AFR-228	Th-228	698.2 days	5341, 5423	5 mm	1 µCi
AFR-238	Pu-238	87.74 years	5456, 5499	5 - 8 mm	1 µCi
AFR-239	Pu-239	2.411E+04 years	5143, 5156	5 - 8 mm	1 µCi
AFR-241	Am-241	432.14 years	5443, 5486	5 mm	1 µCi
AFR-244	Cm-244	18.11 years	5763, 5805	5 mm	1 µCi
The following group of model numbers is sold as is. Activity and active diameters are not variable, and rolled foils all come with gold cover.					
P02A210U	Po-210	138.376 days	5304	9.5 mm	10 µCi
P02A2100U	Po-210	138.376 days	5304	9.5 mm	100 µCi
P02A21000U	Po-210	138.376 days	5304	9.5 mm	1000 µCi
AM1A210U	Am-241	432.14 years	5443, 5486	9.5 mm	10 µCi
AM1A250U	Am-241	432.14 years	5443, 5486	9.5 mm	50 µCi
AM1A2100U	Am-241	432.14 years	5443, 5486	9.5 mm	100 µCi

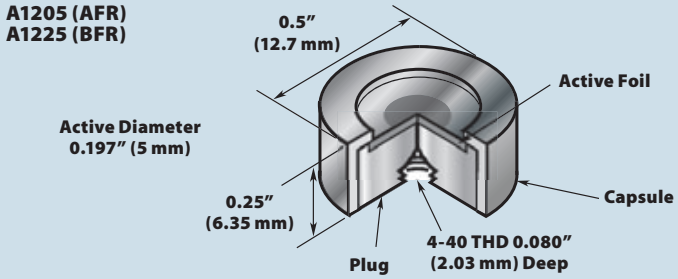
1) All sources listed are not sold as spectral grade sources.
2) 100 µg/cm2 gold covers are available upon request for AFR prefixed models.

Sources for Research Applications

BFR Sources

These sources provide a safe and convenient package for prototype studies, attenuation, and general laboratory use. The standard mount is in an A-2 capsule. Contained activity is supplied as a nominal value ±15%. A NIST traceable calibration of the contained activity is available for Ru-106/Rh-106 only.

Figure 68-A: Type A-2 Capsule



BFR Sources

Catalog Number	Nuclide	Half-Life	Principle Beta Emmissions (E_{max}keV)	Substrate	Window	Maximum Activity	
BFR-106 (1)	Ru-106 / Rh-106	1.020 y	39 / 3540	0.210″ x 0.040″ Ceramic	13.7 mg/cm^2 Al	10 µCi	370 kBq
BFR-090 (1)	Sr-90 / Y-90	28.5 y	546 / 2282	0.210″ x 0.040″ Ceramic	40 mg/cm^2 SS	10 µCi	370 kBq
BFR-204 (1)	Tl-204	3.78 y	763	0.210″ x 0.040″ Ceramic	13.7 mg/cm^2 Al	100 µCi	3.7 MBq

1) Source has a ceramic active element which will reduce beta output.