

# Beta Particle Standards

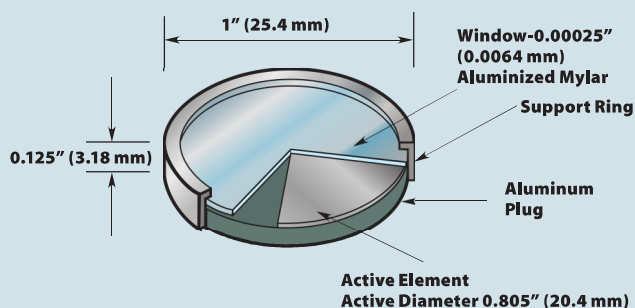
## Beta Particle Standards—Type A

The active material is uniformly distributed over the surface of a 0.937" (23.8 mm) diameter foil and sealed in an aluminum mounting ring under a 0.9 mg/cm<sup>2</sup> aluminized Mylar window for most nuclides. The active diameter of the source is 0.805" (20.4 mm). Special absorbers may be included under the window to filter undesirable low energy radiation. This configuration is most useful for determining efficiencies of G.M. and windowless counters used for beta assaying evaporated liquid samples. The overall source diameter is 1" (25.4 mm) and 0.125" (3.18 mm) thick.



**Figure 42-A: Type A-1 Disk**

**A1209**



### Overall Dimensions

| Overall Diameter | Active Diameter | Height  |
|------------------|-----------------|---------|
| 1"               | 0.805"          | 0.125"  |
| 25.4 mm          | 20.4 mm         | 3.18 mm |

| Nature of Active Deposit                   | Available Activities               |
|--|------------------------------------|
| Evaporated Salts on 0.010" Stainless Steel | 5 nCi - 100 nCi (185 Bq - 3.7 kBq) |

| Exceptions                                    |
|---|
| Bi-210 : 10 nCi - 100 nCi (370 Bq - 3.7 kBq)  |
| Sr-90 : 2.5 nCi - 100 nCi (92.5 Bq - 3.7 kBq) |

## Beta Particle Standards—Type A

| Catalog Number | Nuclide                      | Half-Life                | Substrate                   | Significant Beta Energies (E <sub>max</sub> keV) | Window                                  |
|----------------|------------------------------|--------------------------|-----------------------------|--|---|
| BF-210-A       | Bismuth-210 (Pb-210 parent)  | 22.3 y                   | Stainless Steel             | 1160   | 6.9 mg/cm <sup>2</sup> Aluminum         |
| BF-014-A       | Carbon-14                    | 5730 y                   | Polymeric Membrane          | 156  | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |
| BF-137-A       | Cesium-137                   | 30.17 y                  | Stainless Steel             | 1175   | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |
| BF-036-A       | Chlorine-36                  | 3.01 x 10 <sup>5</sup> y | Stainless Steel             | 1142   | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |
| BF-060-A       | Cobalt-60                    | 5.272 y                  | Stainless Steel             | 1491   | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |
| BF-068-A       | Germanium-68 (1)             | 270.8 d                  | Stainless Steel             | 2921 (β <sup>+</sup> )                           | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |
| BF-147-A       | Promethium-147               | 2.6234 y                 | Stainless Steel             | 225  | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |
| BF-106-A       | Ruthenium-106/Rhodium-106    | 1.020 y                  | Stainless Steel             | 39, 3540   | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |
| BF-032-A       | Silicon-32/Phosphorus-32 (2) | 104 y                    | Stainless Steel             | 225, 1710  | 13.7 mg/cm <sup>2</sup> Aluminum        |
| BF-022-A       | Sodium-22                    | 950.8 d                  | Stainless Steel             | 2842 (β <sup>+</sup> )                           | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |
| BF-090-A       | Strontium-90/Yttrium-90 (3)  | 28.5 y                   | Stainless Steel             | 546, 2282  | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |
| BF-099-A       | Technetium-99                | 2.13 x 10 <sup>5</sup> y | Stainless Steel             | 294  | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |
| BF-204-A       | Thallium-204                 | 3.78 y                   | Stainless Steel             | 763  | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |
| BF-113-A       | Tin-113                      | 115.1 d                  | Platinum Foil or Pt/Clad Ni | 392  | 0.9 mg/cm <sup>2</sup> Aluminized Mylar |

1) Positron emission from Ga-68.

2) This long-lived P-32 standard is the beta emitting P-32 daughter of the long-lived Si-32 parent. The standard mounting for this source is the A capsule with a 0.002" (0.051 mm) Al window. This window will absorb more than 60% of the Si-32 225 keV betas and less than 5% of the P-32 betas. Standards are prepared with the P-32 in equilibrium with the parent Si-32.

3) See page 41 regarding Sr-90 sources.