



# RADIONUCLIDE DATA SHEET

## Samarium – 153



**Sm – 153**    62 protons    91 neutrons

**Radiation:**        Decay mode: Beta

**Major Betas:**

Max E (MeV)	Avg E (MeV)	# per 100 dis
0.632	0.199	34
0.702	0.224	44
0.805	0.263	21

Max. Beta Range in air        288 cm    or    9.45 ft  
 Max. Beta Range in water    0.33 cm

**Major Gammas:**

E (MeV)	# per 100 dis
0.070	5
0.097	1
0.103	28

**Avg. gamma E = 0.636 MeV**

**Half – life:**                1.93 days

**Gamma constant:**    1 mR/hr per 1 mCi at 30 cm

**Radiological data:**

**Min. Ingestion ALI:**    2000 µCi equals 5 rem TEDE (Whole Body)

**Min. Inhalation ALI:** 3000 µCi equals 5 rem TEDE (Whole Body)

**Doses:**

**Skin Dose:**                Reported for 1 µCi over 10 cm<sup>2</sup> of skin  
    10.1 mrad/hr (gamma dose)

**Point Source:** 572 mrad/hr (beta dose)

**Disk Source:** 574 mrad/hr (beta dose)

**Shielding data:**

**Max. range for beta:**        Plastic        =        0.33 cm

   Aluminum     =        0.16 cm

**Tenth Value Thickness for**    Concrete     =        12 cm

**average gamma:**                Lead         =        1.6 cm

**Detection Information:**    Usable Detectors listed with estimated efficiencies  
 (Use efficiencies listed on instrument when available)

<b>Ludlum 3 with pancake probe at 1 cm:</b>	9 %	<b>Liq. Scint. Counter:</b>	85 %
<b>Ludlum 3 with NaI probe near surface:</b>	3 %	<b>Gamma Counter:</b>	30 %

**Action Quantities:**

Bench top quantity must be less than	20000 µCi
Containers require labeling when greater than	100 µCi
Rooms require posting when there is greater than	1000 µCi
Contamination lasting more than 24 hrs require NRC notification when greater than	10000 µCi