# RADIONUCLIDE DATA SHEET [IRON]

Fe-59 — 26 protons — 33 neutrons

***Half Life:*** 44.51 days
***Radiation:*** Decay Mode: Beta
***Gamma Constant:*** 7.35 mR/hr per 1 mCi at 30 cm

***Major Betas:***

| Max E(MeV) | Avg E (MeV) | # per 100 dis |
|---|---|---|
| 0.131 | 0.036 | 1 |
| 0.273 | 0.081 | 45 |
| 0.466 | 0.149 | 53 |

Max. Beta Range in Air : 150 cm
Max. Beta Range in Water : 0.16 cm

***Major Gammas:***

| E(MeV) | # per 100 Dis |
|---|---|
| 0.192 | 3 |
| 1.099 | 57 |
| 1.292 | 43 |

Average gamma E = 1.140 MeV

***Intake Data (annual):***

Minimum Ingestion: 800 µCi equals 5 rem TEDE (WHOLE BODY)
Minimum Inhalation: 300 µCi equals 5 rem TEDE (WHOLE BODY)

***Doses:***

**Skin Dose:** Reported for 1 µCi over 10 cm² of skin
20.0 mrad/hr (gamma dose)
Point Source: 397 mrad/hr (beta dose)
Disk Source: 400 mrad/hr (beta dose)

***Shielding Information:***

| | | |
|---|---|---|
| Maximum Range For Beta | Plastic | 0.16 cm |
| | Aluminum | 0.08 cm |
| Tenth Value Thickness For Average Gamma: | Concrete | 18 cm |
| | Lead | 3.1 cm |

***Detection information:*** Usable Detectors listed with estimate efficiencies

| | | | |
|---|---|---|---|
| Ludlum 3 w/ pancake probe at 1 cm | 11% | Liq. Scint. Counter | 85% |
| Ludlum 3 w/ NaI probe near surface | 1% | Gamma Counter | 60% |

***Action Quantities:***

| | |
|---|---|
| Bench Top Quantity Must Be Less Than | 3000 µCi |
| Containers Require Labeling When Greater Than | 10 µCi |
| Rooms Require Posting When There Is Greater Than | 100 µCi |
| Contamination Lasting More than 24 hrs Require NRC Notification At | 1500 µCi |