

Radioactive Material Safety Data Sheet

This data sheet presents information on radioisotopes only.

For information on chemical compounds incorporating this radionuclide, see the relevant Material Safety Data Sheet.

Cadmium-109

Part 1 – Radioactive Material Identification

Common Names: Cadmium-109	Chemical Symbol: Cd-109 or ^{109}Cd
Atomic Number: 48	Mass Number: 109 (61neutrons)
Chemical Form: Cadmium metal	Physical Form: Cadmium metal electrodeposited on a silver disc and sealed in a welded monel capsule.

Part 2 – Radiation Characteristics

Physical half-life: 462.6 days **Specific Activity (GBq/g):** 95,534

Principle Emissions	E_{Max} (keV)	E_{eff} (keV)	Dose Rate (mSv/h/GBq at 1m)	Shielding Required
Beta* (β)	-	-	-	-
Gamma (γ) / X-Rays	22.1 (54.5%) 21.9 (28.9%) 24.9 (13.7%) 88.0 (3.6 %)	-	49.8 ^a	HVL Lead: < 0.01 cm
Alpha (α)	-	-	-	-
Neutron (n)	-	-	-	-

* Where Beta radiation is present, Bremsstrahlung radiation will be produced. Shielding may be required.

^a *The Health Physics and Radiological Health Handbook*, Scintra, Inc., Revised Edition, 1992

Progeny: Silver-109 (Ag-109)

Part 3 – Detection and Measurement

Methods of detection (in order of preference)

1. A radiation survey meter equipped with an energy-compensated Geiger Mueller detector.
2. A radiation survey meter equipped with a low energy gamma scintillator. The scintillator must be calibrated for Cd-109 before using it for a dose assessment survey.
3. A radiation contamination monitor equipped with a Geiger Mueller pancake detector.

Part 7 - Emergency Procedures

*The following is a guide for first responders. The following actions, including remediation, should be carried out by qualified individuals. In cases where life-threatening injury has resulted, **first** treat the injury, **second** deal with personal decontamination.*

Personal Decontamination Techniques

- Wash well with soap and water and monitor skin
- Do not abrade skin, only blot dry
- Decontamination of clothing and surfaces are covered under operating and emergency procedures

Spill and Leak Control

- Alert everyone in the area
- Confine the problem or emergency (includes the use of absorbent material)
- Clear area
- Summon Aid

Damage to Sealed Radioactive Source Holder

- Evacuate the immediate vicinity around the source holder
- Place a barrier at a safe distance from the source holder (min. 5 meters)
- Identify area as a radiation hazard
- Contact emergency number posted on local warning sign

Suggested Emergency Protective Equipment

- Gloves
- Footwear Covers
- Safety Glasses
- Outer layer or easily removed protective clothing (as situation requires)

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