

## 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

<b>Common Names:</b> Cadmium-109	<b>Chemical Symbol:</b> Cd-109 or <sup>109</sup> Cd
<b>Atomic Number:</b> 48	<b>Mass Number:</b> 109 (61neutrons)
<b>Chemical Form:</b> Cadmium metal	<b>Physical Form:</b> 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 <sup>Max</sup> (keV)	E <sup>eff</sup> (keV)	Dose Rate (□Sv/h/GBq at 1m)	Shielding Required
Beta* (□)	-	-	-	-
Gamma (□) / X-Rays	22.1 (54.5%) 21.9 (28.9%) 24.9 (13.7%) 88.0 (3.6 %)	-	49.8 <sup>a</sup>	HVL Lead: < 0.01 cm
Alpha (□)	-	-	-	-
Neutron (n)	-	-	-	-

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

<sup>a</sup> *Handbook of Health Physics and Radiological Health*, Lippincott Williams & Wilkins , Third Edition, 1998

**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.



**Part 6 – Non-Radiological Hazards**

Probably carcinogenic to humans – although the dose has not been established. Cumulative damage to kidneys and lung tissues has been observed.

OSHA Permissible Exposure Level (PEL):

TWA 5  $\mu\text{g}/\text{m}^3$ , Action Level 2.5  $\mu\text{g}/\text{m}^3$

**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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