



## Canadian Nuclear Safety Commission Radiation 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.

<b>Part 1 - RADIOACTIVE MATERIAL IDENTIFICATION</b>			
Chemical Symbol:	Cd	Common Names:	Cadmium
Atomic Weight:	109	Atomic Number:	48

<b>Part 2 - RADIATION CHARACTERISTICS</b>
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<b>Physical Half-Life:</b>	1.27 years	
<b>Unconditional Clearance Levels:</b>	Activity Concentration (Bq/g)	1 x 10 <sup>0</sup>
<b>CNSC Exemption Quantity:</b>	Activity Concentration (Bq/g)	1 x 10 <sup>4</sup>
	Activity (Bq)	1 x 10 <sup>6</sup>

Principal Emissions	Average Energy of Most Abundant Emission (MeV)	Maximum Energy of Most Abundant Emission (MeV)	Gamma-Ray Dose Rate at 1m Distance (mSv/h per GBq)	Shielding Information <sup>2</sup>
Neutrons	-	-	-	-
Gamma & X-ray	0.08803	-	0.045	Tenth-value layer (lead): < 1mm
Beta* & Electron	<0.01	-	-	Total absorption: 0.1 mm glass or 0.2 mm plastic
Alpha	-	-	-	-

\* Where beta radiation is present, bremsstrahlung radiation will be produced. Shielding for bremsstrahlung radiation must be considered.

<sup>1</sup>Shleien, B. et al, Handbook of Health Physics and Radiological Health Third Edition, 1998.

<sup>2</sup>Delacroix, D. et al, Radionuclide and Radiation Protection Data Handbook 2002.

<b>Progeny</b>	
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### Part 3 - DETECTION AND MEASUREMENT

**Method of Detection:**

Gamma probe (e.g., NaI scintillation counter)

**Dosimetry:**

External: TLD (whole body & skin)  Extremity  Neutron   
 Internal: Whole body  Thyroid  Urine analysis  Other (specify)  Feces

### Part 4 - PREVENTATIVE MEASURES

Cadmium and its compounds are toxic by ingestion and inhalation. The oral toxicity of Cd and its compounds is high. However, ingestion usually causes a strong emetic action, little Cd is therefore absorbed and fatal poisoning rarely occurs. Cadmium and some compounds are suspected carcinogens. Flammable in powder form.

Recommended protective clothing: No protective clothing is necessary for work with sealed sources. When working with unsealed sources wear appropriate protective clothing, such as laboratory coats, coveralls, gloves, and safety glasses/goggles. Lab coats must be monitored before leaving the laboratory. Use a suitable mask if the radioactive material is in the form of a dust, powder or if it is potentially volatile.

Optimize time, distance, shielding. Manipulate sealed sources remotely to minimize extremity doses. Consult CNSC license for requirements concerning engineering controls, protective equipment, and special storage requirements. Use disposable absorbent liners on trays.

### Part 5 - ANNUAL LIMIT ON INTAKE

	<b>Ingestion</b>	<b>Inhalation</b>		
Compound Type	All inorganic compounds	Oxides, hydroxides	Sulphides, halides, nitrates	Unspecified compounds
Annual Limit on Intake (Bq)	$1 \times 10^7$	$5 \times 10^6$	$4 \times 10^6$	$2 \times 10^6$



## 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. In the case of an emergency, the Radiation Safety Officer should be contacted as soon as practicable.

### 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
- Clear area
- Summon Aid

### Emergency Protective Equipment, Minimum Requirements

- Gloves
- Footwear Covers
- Safety Glasses
- Outer layer or easily removed protective clothing
- Suitable respirator selected

Canadian Nuclear Safety Commission  
P.O. Box 1046, Station B  
Ottawa, Canada  
K1P 5S9

Tel: (613) 995-5894 Fax: (613) 995-5086  
24 Hour Emergency Hotline: (613) 995-0479

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