



**Canadian Nuclear Safety Services Inc.
Consultants in Radiation Safety and Hazardous Materials
Management**

Visit us at: <http://www.nuclearsafety.ca>

Radiation Safety Data Sheet

This data sheet presents information on radioisotopes only. CNSC does not guarantee data accuracy.
For information on chemical compounds incorporating this radionuclide, see the relevant Material Safety Data Sheet.

Part 1 - RADIOACTIVE MATERIAL IDENTIFICATION			
Chemical Symbol:	Pu	Common Names:	PLUTONIUM-238
Atomic Weight:	238	Atomic Number:	94

Part 2 - RADIATION CHARACTERISTICS

Physical Half-Life: 87.7 years

A CNSC license is not required if the amount of radioactive nuclides possessed is less than one Exemption Quantity.

Principal Emissions	Approximate energies (MeV) and Intensities	Eeff (MeV)	Dose Rate at 1m Distance (mSv/hGBq)	Shielding Requires TVL Lead (cm)
Gamma & X-rays	U L X-rays, 0.099 (8x10 ⁻³) 0.150 (1x10 ⁻³) 0.77 (5x10 ⁻⁵) 5.5303E-2		2.135-2 (0.02) PF	0.003
SF Neutrons	1.927 y (i) = 4.2x10 ⁻⁹	8.08E-9		
Alpha	E _{max} (MeV) 5.50 (72%), 5.46 (28%) 5.499 (ICRP 38)			

Progeny U-234

Part 3 - DETECTION AND MEASUREMENT

Method of Detection: 1) Zinc Sulphide Detector 2) Neutron detector (if Pu mixed with Be)

Dosimetry:

External: TLD (whole body & skin) Extremity Neutron

Internal: Bones, Lungs, Liver

Part 4 - PREVENTATIVE MEASURES

Low energy gamma radiation from sealed sources. No protective clothing is necessary for work with sealed sources.

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.

Part 5 – CONTROL LEVELS

Effective Dose Coefficients

F (fast)		M (moderate)		S (slow)	
Ingestion	Inhalation	Ingestion 2.3E-7	Inhalation 4.3E-5	Ingestion 4.9E-8	Inhalation 1.5E-5
Maximum release Concentration (as on current form)		Atmosphere (Bq/m ³) default	Sewer Bq/L Default	Landfill/incinerator (Bq/Kg) default	
Exemption Toxicity		3.7 E+3 Bq			

Part 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.

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

Emergency Protective Equipment, Minimum Requirements

Gloves

Footwear Covers

Safety Glasses

Outer layer or easily removed protective clothing

Suitable respirator selected