

RADIONUCLIDE SAFETY DATA SHEET					
RADIONUCLIDE: Sr-90			FORMS: Soluble		
PHYSICAL CHARACTERISTICS					
HALF-LIFE: 28.8 years					
DECAY EMISSIONS					
Includes Y-90 emissions under the assumption of secular equilibrium					
Gammas / X-rays		Betas / Positrons (+) / Electrons*		Alphas	
E (keV)	%	E (keV, Ave)	%	E (keV)	%
		196	100		
		933	100		
- Only 4 most probable emissions per decay type included. Emissions below 10 keV or 1% excluded.					
STANFORD HAZARD CATEGORY					
C – level (low hazard): ≤ 20 μCi					
B – level (moderate hazard): > 20 μCi, ≤ 1 mCi					
A – level (high hazard): > 1 mCi					
EXTERNAL RADIATION HAZARDS			INTERNAL RADIATION HAZARDS		
Includes Y-90 emissions			Annual Limit on Intake: 30 μCi (Ingestion)		
Gamma dose rate, point source at 1 ft, 1 mCi:			4 μCi (Inhalation)		
0 mrem/h			The values above indicate the activity taken into the body that would result in either 50 rem bone surfaces.		
Beta dose rate to skin, point source at 1 ft, 1 mCi:					
755 mrem/h					
Contamination skin dose, uniform deposit of 1 μCi per cm ² :					
13000 mrem/h					
SHIELDING			DOSIMETRY AND BIOASSAY REQs		
Includes Y-90 emissions			Whole-body and finger-ring dosimeters are required for handling 5 mCi or more, or 1 mCi amounts weekly . Urine assays may be required after spills or contaminations.		
Gammas/X-rays:					
N/A					
Betas/electrons:					
10 mm of plastic will absorb all emissions.					
Bremsstrahlung may be created and require additional shielding.					
SPECIAL PROBLEMS AND PRECAUTIONS:					
<ol style="list-style-type: none"> 1. Recommended survey probe: PGM 2. Always wear protective gloves, a lab coat, and safety eyewear to protect the skin and eyes from contamination. Change gloves often. 3. Survey work areas before, during, and after work. Work areas may require shielding to keep dose ALARA. Instrument and smear surveys are required. 4. Segregate waste to those with half-lives greater than 120 days (excluding H3 and C14). Survey the waste disposal area to ensure exposure rates are less than 2 mR/hr at 1 foot. 5. Limit soluble waste to the sewer to less than 0.1 μCi/day per lab. 					

References:

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- ICRP, 2008. Nuclear Decay Data for Dosimetric Calculations. ICRP Publication 107. Ann. ICRP 38 (3).
- Peplow, D. (2020) Specific Gamma-Ray Dose Constants with Current Emission Data. *Health Physics*, 118(4):402-416; 2020.
- Smith, D., Stabin, M. (2012) Exposure Rate Constants and Lead Shielding Values for Over 1,100 Radionuclides. *Health Physics*, 102(3): 271-291.
- 10.CFR.20 – Standards for Protection Against Radiation (2019). Retrieved from <https://www.nrc.gov/reading-rm/doc-collections/cfr/part020/>