

^{57}Co

Radioisotope Fact Sheet

Cobalt 57

Half life 271.8 days

Radiations emitted

Radiation	Energy (keV)	Yield (%)
Gamma ray	14	9
Gamma ray	122	86
Gamma ray	137	11

Safety precautions

^{57}Co is a medium energy gamma ray emitter that presents a mainly external irradiation hazard.

Handling tools and standard laboratory PPE (gloves, lab coat, safety glasses) should be used to minimise exposure.

Because of the relatively low gamma ray constant, shielding at a workstation will only be required where sources with activities greater than about 100 MBq are handled in an unshielded condition. Wastes stored in the laboratory containing more than about 10 MBq of ^{57}Co may require shielding with lead sheet. Wastes should be monitored with a survey meter to ensure radiation levels are acceptable.

NB radiation levels in controlled areas must not exceed 40 μSv per week, and in areas accessible to non-radiation workers, 10 μSv per week.

Radiotoxicity data

^{57}Co is classed as being of high hazard (Group 2) according to AS/NZS 2243.4.

The Annual Limit on Intake by ingestion (ALI_{ing}) is 95 MBq and the most restrictive inhalation limit ($\text{ALI}_{\text{inhal}}$) is 21 MBq.

Dose rates

The gamma ray dose rate constant for ^{57}Co is 41 $\mu\text{Sv/h/GBq}$ at 1 m

Dose rate to the basal skin cells from contamination of 1 kBq cm^{-2} : 119 $\mu\text{Sv h}^{-1}$

Dose rate from a 1 kBq (0.05 ml) droplet on skin: 1.6 $\mu\text{Sv h}^{-1}$

Shielding

Half value layer (HVL) is less than 1mm of Pb

NB Perspex workstation shielding offers no protection from ^{57}Co Gamma radiation.

Licensing requirements

Under the *Radiation Safety Regulation 2021*, a licence is required to possess ^{57}Co sources with concentrations equal to or greater than 100 Bq per gram and with activities of 1 MBq or greater. Individual use licences are required for persons who use licensable sources for research purposes.

Disposal data

The maximum concentration of ^{57}Co in aqueous wastes released to a sewerage system is given in the *Regulation* as 6.52 MBq per m^3 i.e. 6.52 kBq per litre.

The concentration of ^{57}Co in solid wastes disposed of to either the general or pathology waste streams must be less than 50 Bq per gram (50 kBq per kg) – i.e. half the concentration limit for licensing.

Radiation detection and monitoring

A large diameter end window or pancake type GM tube contamination monitor is the most suitable type of meter for contamination control. TLD/OSL dosimeters are recommended for whole body personal monitoring.

Laboratory requirements

Indicative maximum activities:

Low level	Bench	4 MBq
	Fume cupboard	40 MBq
Medium level	Bench	10 MBq
	Fume cupboard	100 MBq