



# SELENIUM 75 (Se-75)

## INDUSTRIAL ISOTOPE DATASHEET

Selenium-75 is a gamma-emitting isotope with a half-life of 119.8 days. It is commonly used in industrial radiography, particularly for non-destructive testing (NDT) of thinner-walled steel structures. Its reduced energy output enhances radiographic contrast sensitivity for thinner materials and improves shielding effectiveness in radiography equipment.

Gammatec, supplies Selenium-75 sealed sources globally, with a focus on use in our GamCPR Close Proximity Radiography solution with radiation safety achieved by utilizing a system of X-ray or Gamma emitting devices incorporating special collimation with rigid and / or flexible shielding to reduce the Primary Beam and scattered radiation to safe levels at the desired barrier distance.



Gammatec NDT Supplies SOC Ltd Is A Leading Provider Of Non-Destructive Testing (NDT) Equipment, Accessories, And Consumables. With Over 40 Years Of Experience, The Company Has Established A Reputation For Delivering High-Quality Solutions And Outstanding Customer Support.

## WHY SELENIUM 75?

For gamma-based non-destructive testing (NDT), the performance of a radioactive isotope hinges on its ability to penetrate the target material and produce a clear image with sufficient contrast. Isotopes emitting low-energy gamma rays struggle to pass through dense objects, often resulting in blurry or poor-quality images. On the other hand, those with excessively high energies may produce images with insufficient contrast due to over-penetration.

Se-75 offers an optimal balance, with a gamma energy spectrum ranging from 66 keV to 401 keV, predominantly featuring strong emissions at 136 keV and 265 keV. This spectrum makes Se-75 particularly effective for capturing detailed images of materials within the 5 mm to 30 mm thickness range.

## KEY ADVANTAGES

Contrast Sensitivity

Ideal for thinner materials and improves shielding effectiveness in radiography equipment

Versatility

Suits a range of industrial applications

Image resolution

Delivers sharp, superior quality images

Compatible Projectors

- Exertus: Dual 120, Fortes, Circa, RidSe4P, ITS
- Sentinel 880 Series

### SHIELDING REFERENCE GUIDE


Material	Density (g/cm <sup>3</sup> )	Half-Value Thickness
Aluminium	2.65	27.0 mm
Steel	7.80	8.0 mm
Lead	11.34	1.0 mm
Tungsten	17.80	0.8 mm

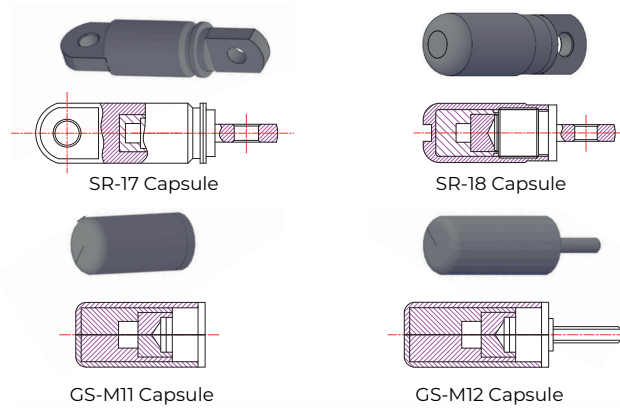


Gammatec NDT Supplies SOC Ltd Is A Leading Provider Of Non-Destructive Testing (NDT) Equipment, Accessories, And Consumables. With Over 40 Years Of Experience, The Company Has Established A Reputation For Delivering High-Quality Solutions And Outstanding Customer Support.

FOCAL SPOT SIZES		ACTIVITY RANGE	
Active Diameter (mm)	Active Height (mm)	GBq	Ci
1.0	1.0	74 - 222	2 - 6
1.5	1.5	370 - 555	10 - 15
2.0	2.0	740 - 1295	20 - 35
2.5	2.5	1,480 - 2,220	40 - 60
3.0	3.0	2,590 - 3,515	70 - 95
3.5	3.5	3,700 - 4,810	100 - 130

## TECHNICAL SPECIFICATIONS

Basic Construction Standards	ISO 3999:2004 Compliant
Half Life	119.8 Days
Image Resolution	
Gamma Energy Range	100 - 400 keV
Steel Thickness Range	5 - 30 mm
Exposure Rate Constant	0.20 R-m2/hr-Ci
Se-75 Capsules Types	SR, GS
Double encapsulated	Inner vanadium capsule, stainless steel outer capsule



## BEST PAIRED WITH EXERTUS CIRCA FOR CPR

Type	RUS / 5789 / B(U)-96T
Isotopes	Se-75 under special form
Se-75 half-life	119.8 days
Activity Se-75	CIRCA 40 - 1.5TBq (40Ci) CIRCA 80 - 2.96TBq (80Ci) CIRCA 120 - 3.7TBq (100Ci)
Surface Dose Rate	Max. 2mSv/h
Total Weight	CIRCA 40 - 8.4Kg (18.5lb) CIRCA 80 - 8.8Kg (19.4lb) CIRCA 120 - 9.0Kg (19.8lb)
Tungsten Weight	CIRCA 40 - 4.7Kg (10.36lb) CIRCA 80 - 5.0Kg (11lb) CIRCA 120 - 5.3Kg (11.68lb)





Gammatec NDT Supplies SOC Ltd Is A Leading Provider Of Non-Destructive Testing (NDT) Equipment, Accessories, And Consumables. With Over 40 Years Of Experience, The Company Has Established A Reputation For Delivering High-Quality Solutions And Outstanding Customer Support.

### CAPSULE DIMENSIONS AND SAFETY PERFORMANCE TESTING

Se-75 Capsule Type	External Dimensions ø (mm) x h (mm)	External Capsule Material	ISO classification
SR-17 for EXERTUS CIRCA/RID-Se4P/Light	6.7 x 27	Steel 12X18H10T (321AISI)	C 63545
SR-18 for EXERTUS DUAL 60/120	7.15 x 23.5	Steel 12X18H10T (321AISI)	C 63545
GS-M11	6 x 12	Steel 12X18H10T (321AISI)	C 63545
GS-M12	6 x 20	Steel 12X18H10T (321AISI)	C 63545

## ADDITIONAL INFORMATION

Source forms

All Se-75 sources are supplied in Special Forms for enhanced safety, compliance, and performance.

Transport Container

Gammatec transport fleet consist of:

- Multiple 6 Channel Transport Containers for Wire Type Source Assemblies.
- Multiple 4 Channel Transport Containers for Re-usable Link Type Source Assemblies.
- Limited 6 Channel Tungsten Transport Containers that will accommodate Wire and Link Type Source Assemblies.

Loading Facilities

Gammatec also have the capability to produce sources from multiple facilities across the Globe.

### CONTACT US

Vision 21 Industrial Park, Steel Road, Peacehaven, Vereeniging.  
P.O. Box 264786, Three Rivers, 1939, South Africa  
**+27 16 423 7731**  
**info@gammatecsa.com**  
**www.gammatecsa.com**